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Srovnání bankovního odvětví v Evropě a Číně
Comparison of Banking Industry in Europe and China

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1. Introduction
2. Characteristics of Selected Banking Industry
3. Description of the Evaluation Methodology of Banks
4. Comparison of Banking Industry in Europe and China
5. Conclusion

Bibliography
List of Abbreviations
Declaration of Utilisation of Results from the Bachelor Thesis
List of Annexes
Annexes

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The declaration

I hereby declare that I have elaborated the entire thesis including annexes myself.

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Contents:

1 Introduction

A bank is a financial institution established in accordance with the law to handle money and credit business. It is the product of the development of commodity money economy to a certain stage. Banking usually as a tool to control inflation and stimulate economic development.

Since the middle and late 1980s, the wave of financial liberalization and deregulation has swept the world, and information technology has developed rapidly. Under the great influence of these two forces, the development of international banking has undergone many new changes, showing a new trend of development. The European financial system is a kind of financial system dominated by indirect financing by Banks, which is very similar to the development state of the Chinese financial system at present and for a long time to come.

The aim of this thesis is to compare selected banks efficiency in China and the European Union from 2014 to 2019, and it has to through calculating some financial indicator to analysis the comparison of the selected banks from China and European Union.

This thesis contains five chapters. The first chapter will be introduction, mainly introduce the procedure of thesis. The second chapter will introduce banking in general, including the core function and the types of bank of bank. And also, there will describe banking in China and the European Union, which contains of the macroeconomic in china and European Union, history of banking, structure and regulation in banking sector.

The third chapter will describe the methodology of financial ratios, which were chosen to analysis for the selected bank. This part will be divided into profitability ratios, liquidity ratios, activity ratios, marketability ratios, financial leverage ratios and asset quality ratios, which present the banks' efficiency and performance in different aspects.

In the fourth chapter we will choose 4 largest banks from China and 4 largest banks European Union, the banks what we will choose that mainly according to its total assets. And we will analysis the different between the selected banks of China and European Union with figures according the results. After that, a summary will be included and to show the main results from the comparison. The fifth chapter will be conclusion and there will be the main result that we summarize from the thesis.

2 Characteristics of Selected Banking Industry

A bank is a monetary enterprise whose existence facilitates the raising and financing of social funds. It is a very important member of financial institutions. We can sort out the relevant business of the bank. On the one hand, it collects the idle monetary capital and the savings of small amount of money in the society in the form of deposit-taking, and then lends it to those who need supplementary money in the form of loans. Here, Banks act as intermediaries between lenders and borrowers. On the other hand, Banks handle the receipt, payment and settlement of money for commodity producers and merchants, and act as payment intermediaries. In this section, we introduce the main features of the banks, described the general situation of the banking sector in the EU and in China, by introducing their history, banking structure and the regulation of banking.

2.1 Characteristic of the Selected Banking Sectors

A bank is a financial institution established in accordance with the law to handle money and credit business. It is the product of the development of commodity money economy to a certain stage.

2.1.1 The Function of Banking

In general, banking is concerned with the acceptance of money on deposit and the use of that money to offer other services to customers. Banks provide personal, government and business finance through credit. Banking also involves the investing of money in a variety of ways. These bank accounts and services produce an income to the bank concerned. We can summarize these bank functions into five aspects: credit intermediary, payment intermediary, credit creation, financial services and economic regulation.

Credit intermediary

As we know, credit intermediary is the most basic function of commercial banks that can best reflect the characteristics of their business activities. Banks concentrate all kinds of idle funds in society into banks, and then invest them in various social and economic sectors through the asset business of commercial banks to achieve efficient and effective capital flow. On the one hand, this function can transform short-term capital into long-term capital. On the other hand, it can also exaggerate the total amount of social capital and accelerate economic growth.

Payment intermediary

We are well aware that the basic function developed by the bank at the earliest is the payment intermediary function. Banks use payment and settlement instead of customers to centrally handle currency collection and payment, which plays an important role in reducing the use of cash in circulation, saving circulation costs, and accelerating capital turnover. With commercial Banks as the center, we should form a never-ending payment chain and debt-creditor relationship in the economic process.

Credit creation

On the basis of the previous credit intermediation functions and payment intermediation functions, banks generate credit creation functions. A commercial bank is a bank that can absorb various deposits and use the various deposits for loans. On the basis of check circulation, account transfer and settlement, the loan is converted into a deposit. On the basis of this cash withdrawal or incomplete withdrawal, a long-term deposit that is several times the original deposit is formed. In this way, the social money supply is expanded.

Financial services

We know that with the development of the economy, the market environment is becoming more and more complicated, and the commercial competition between banks is becoming more and more fierce. Personal consumption has also evolved from the original simple currency and commodity transactions to transfer settlement. Under the powerful force of commercial competition, banks continue to expand their service areas. Through the development of financial services business, they further promote the expansion of assets and liabilities business, and combine assets and liabilities business with financial services to expand new business areas. In modern economic life, financial services have become an important function of commercial banks.

Economic regulation

The last economic regulation function refers to the bank's credit intermediary activities to adjust to the shortage of funds in various sectors of the society. At the same time, under the guidance of the central bank's monetary policy and other countries' macro policies, it has adjusted the economic structure, consumption ratio investment, and industrial structure.

2.1.2 Types of Banking Sector

We try to explain different types of banks by focusing on different types of customer served and range of services offered.

Commercial banking involves the acceptance of deposits, the making of loans, bill finance, investment management and more to customers. Today, such banks give credit cards, savings and checking accounts and financial services to their customers. Some types of commercial banks also serve as foreign exchange banks. Like other types of financial institutions they provide online banking service to customers.

Investment banking handle securities business for their customers for which they receive commissions. These banks give a wide range of services to customers. These include investment advice to various types of bank customer, also assistance and advice on money management and cash flows for small and medium industrial and manufacturing companies. An investment bank does not normally checking and savings accounts or give home loans and credit card.

Private banks are financial institutions that provide high-net-worth people with property investment and management services. The most important private banking services are asset management, planning investment, providing special services according to customer needs, and also saving tax and financial transaction costs for customers through the establishment of offshore companies and family trust funds.

Corporate Banking has to do with the providing of products and service to corporate clients separate from retail services. These banking institutions offer their clients special services like wealth management and private banking.

International banking (also called foreign banks) have their head-quarters in one country but conduct much of their business in other parts of the world. We all have to recognize that they are the product of the internationalization of the banking industry and the most basic subject of international financial law.

Offshore banking involves the holding of accounts for companies conducting business outside of the country where the bank is registered. Under normal circumstances, it refers to the financial intermediary business that mainly handles deposits and loans of non-residents. That is, the funds are taken from abroad and applied abroad. They are completely unrelated to the financial market of the country where the bank is located. They are not subject to the financial control of the country where they are located. But offshore banks do not offer checking accounts, savings and loan or other deposit accounts

in the country where they operate.

Retail banking offer different banking accounts and banking services such as credit and debit cards, loans, savings accounts, etc., personally and directly to their customers. They make money from the interest they apply to account balances. They are usually private sector entities. Some pay higher interest rates on savings accounts than do others. Other services of a retail bank include personal loans, business loans, safe deposit boxes and certificates of deposit cds. Compared with other banking businesses, retail banking has the following main features:

- customers are mainly individual customers,
- sporadic transactions,
- transaction amounts are small.

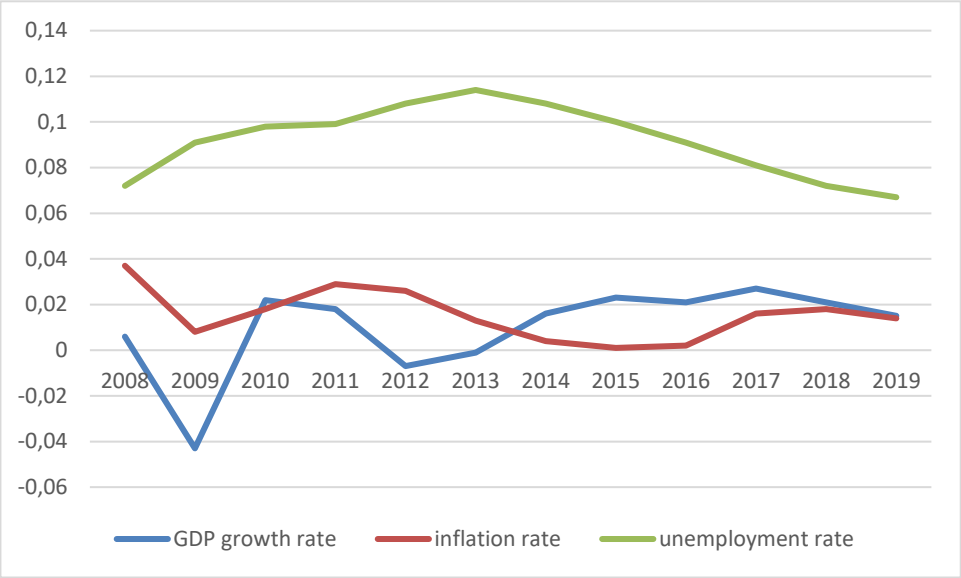
2.2 Banking Sector in European Union

In this section, we will explain the development of the EU in recent years, and measure the economic environment of the EU through several macroeconomic indicators. In addition, we will also discuss the structure of the European Union's banking industry, and finally introduce the changes in the European banking regulatory system and regulatory policies. Of course, we will also briefly describe the history of European banks in this section.

2.2.1 Basic Information of Macroeconomic in European Union

Since the economic crisis in 2008, the data presented by the EU's macroeconomic indicators have shown a downward trend. At present, the economic growth rate of Europe is relatively slow, while the growth of foreign trade is weak, and the downward pressure on the economy still exists. However, since 2014, the European labor market is strong, the inflation rate is trending well, and the EU economic market continues to improve. We believe that the EU will achieve rapid and stable economic growth in 2019. Talking about the EU's macro economy, we can see from Figure 2.1.

Figure 2.1 The macroeconomic database in European Union



Source: own calculation (GDP data & inflation data & unemployment data:eurostat)

The statistic shows the inflation rate in the European Union and the Euro area from 2008 to 2019. The term inflation, also known as currency devaluation (drop in the value of money), is characterized by a steady rise in prices for finished products (consumer goods, capital goods). The consumer price index tracks price trends of private consumption expenditure, and shows an increase in the index's current level of inflation. In 2008, it was hit by the economic crisis, with an average annual GDP of only 3.7%. The sharp rise in consumer price inflation can be largely attributed to the rapid increase in energy and food prices between autumn 2007 and autumn 2008. In 2009, the EU 's annual inflation rate fell to only 0.8%, and the EU 's annual GDP growth rate even fell back to negative, only -4.3%. But after the EU countries cooperated and the economy slowly recovered, in 2017, the GDP growth rate reached 2.7%.In 2018, the inflation rate in the EU was about 1.93 percent compared to the previous year. Faced with some problems in macroeconomic development, the European Commission announced the European Union 's economic development plan for the next decade, the "EU 2020 Strategy", aimed at strengthening the coordination of economic policies among member states, promoting economic growth and expanding employment.

2.2.2 History of Banking in Europe

The word "bank" comes from the Italian word Banca, meaning "bench," which early bankers used to trade in the market. Translated into English as "bank," which means locker for money, early bankers were called "bench men."

Generally speaking, we all guess that the prototype of the bank appeared in BC. The babylonian temples of 2000 BC and the Greek temples of 500 BC already had institutions to keep gold and silver, collect interest and issue loans. Modern banking originated in Italy in the middle ages. Because of its special geographical position, Venice became a trading center at that time. When money changers sought to make more profits by making loans out of their accumulated money to earn interest, the money changers developed into bank. In 1580, the bank of Venice was established, which was the earliest bank in the world. Later, Banks were established in other cities in Italy, as well as in Germany and the Netherlands.

It is generally believed that the earliest bank is thought to have been an Italian bank founded in Venice in 1407. Later, the Dutch established Banks in Amsterdam, Germany in Hamburg, and England in London. In the late 18th and early 19th centuries, Banks developed in general. In the 17th century, some commoners became wealthy merchants by doing business. They kept their money in the king's vault for safety.

In 1638, when the king of England was Charles I, he went to war with the Scots aristocracy. To finance his war, he commandeered the gold of the common people in the mint and lent it to the king. Here is Charles I. Later, in 1649, he was beheaded by Cromwell in what became known as the English bourgeois revolution, as detailed in the notes on the history of England. Although the requisitioned gold was eventually returned to its original owner, the merchants felt that the mint was no longer safe. So they deposited the money with the Goldsmith. So the goldsmith opened a certificate for the depositor, and with this certificate he could withdraw the gold. Soon, the merchants found that when they needed money, they did not need to take out the gold at all. Later, the goldsmith suddenly realized that the certificate he had opened had the effect of money! Unable to resist the temptation, they began to open "fake certificates". But the magic is that as long as all the customers do not come to fetch gold on the same day, "fake certificates" are equivalent to "real certificates". This is the origin of the "reserve system" in modern Banks and the origin of the "money creation" mechanism. The banking system can magnify the amount of credit money; physical money cannot. In the late 1660s, we thought this was the real birth of modern banks.

2.2.3 Structural Banking Sector in European Union

In this small section, there is the European Central Bank ’s structural financial indicator data set for the EU banking industry. The European Central Bank's statistics support the agency's monetary policy and regulatory functions, as well as other tasks of the Euro system and the European Central Bank system. The European Central Bank

mainly focuses on the Eurozone. In order to produce a meaningful total euro area, all basic national data must be based on a common set of definitions and classifications in order to be sufficiently comparable. The European Central Bank strives to minimize the burden of data reporting on credit institutions and other reporting agencies while ensuring that its statistical requirements are met. It therefore uses existing statistics wherever possible, which are more favorable to our study. We can see in the Tab. 2.1.

Tab. 2.1 Country-by-country statistics – Euro area Member States

	Number of credit institutions	Assets (€ million)	Loans (€ million)	Deposits (€ million)	Capital and reserves (€ million)	Staff
Austria	544	845,380	565,048	543.705	78,008	71,798
Belgium	88	1,001,881	601,842	664,939	72,797	51,740
Cyprus	32	69,861	48,538	42,784	13,560	8,946
Germany	1,584	7,775,993	4,981,050	4,857,395	599,066	564,935
Estonia	37	26,207	24,608	18,020	3,588	5,317
Spain	200	2,645,174	1,622,579	1,843,490	269,430	179,055
Finland	257	628,492	374,908	234,683	52,803	20,796
France	409	8,810,390	5,412,610	4,701,364	619,746	408,941
Greece	37	292,595	190,919	178,114	59,444	39,382
Ireland	327	1,101,935	332,900	302,891	92,430	27,940
Italy	508	3,669,283	2,388,626	2,623,710	380,251	274,056
Lithuania	85	30,064	26,672	24,235	3,144	9,165
Luxembourg	135	1,077,297	470,964	455,247	60,136	26,317
Latvia	54	22,792	18,128	15,318	3,408	7,345
Malta	24	44,435	19,805	23,291	4,297	5,044
Netherlands	93	2,320,609	1,384,483	1,181,180	143,667	72,199
Portugal	141	390,771	239,657	283,121	54,456	50,819
Slovenia	17	40,630	28,130	31,942	4,804	9,683
Slovakia	27	82,005	61,155	61,934	10,466	19,539
Eurozone	**4,599**	**30,875,794**	**18,792,622**	**18,086,933**	**2,525,501**	**1,853,017**

Source: https://www.ebf.eu/facts-and-figures/statistical-annex/

This table focuses on banks. We could see the number of institutions, assets, loans, deposits, capital and resevers of each country in Euro area. However, the pure data on banks is not available from the ECB. For this reason, the EBF uses both the Credit Institutions (CI) and the Monetary Financial Institutions (MFI) depending on which type of data is available. Since banks represent around 75-80% of the entire financial system in the EU, the EBF deems it feasible to base the analysis of the banking sector on the ECB's CI and MFI data.

The European Union is an important economic force in the world. The 28 countries have an area of 2.42 million square kilometers and a population of 350 million. The GDP of the 12 European countries in 1992 was us $6841.2 billion (at current exchange rates and prices). The EU is the world's largest trading bloc, with a total foreign trade volume of about us $2972.2 billion in 1992, of which us $1451.86 billion was exported and us $1520.27 billion was imported.The birth of the European Union enabled the free circulation of goods, services, personnel and capital in Europe, and the rapid growth of the European economy. Between 1995 and 2000, the economy grew by 3%, and per capita GDP rose from $19,000 in 1997 to $20,600 in 1999. The eu's economy

grew from about $6.7 trillion in 1993 to nearly $10 trillion in 2002.

Euro zone also refers to the area of countries in the European Union that use the single currency of the European Union -- the euro. On January 1, 1999, European Union countries began to implement a single currency, the euro, and a single monetary policy in the euro countries. There are 19 members of the euro zone and nine other countries and territories have adopted the euro as their own single currency. But the euro, a rival to the dollar as the world's reserve currency, has moved beyond these areas.

The European Central Bank (ECB) is responsible for the financial and monetary policies of the European Union ’s Eurozone. It was formally established on July 1, 1998 in accordance with the provisions of the 1992 Maastricht Treaty. It is a financial institution established to adapt to the issuance and circulation of the euro. It is also a product of European economic integration. It operates the so-called single supervisory mechanism (SSM) together with the national central bank supervisory authority. The decision involved in this function is mainly aimed at ensuring the security and soundness of the European banking system.

The European central bank is the first central bank in the world to manage a supranational currency. Independence is one of its distinguishing features: it does not accept directives from the European governing bodies and is not monitored by national governments. It is the only institution eligible to issue euros within the European Union, and when the currency is officially launched on January 1, 1999, the 11 euro-zone governments will lose the power to set monetary policy and will have to follow the monetary policy set by the European central bank.

Obviously, we all know that the decision of the Council is decided by a simple majority, and each member has only one vote. Although the power of monetary policy is centralized, the specific implementation is still the responsibility of the central bank of the euro country. The central banks of euro area countries still retain their foreign exchange reserves. The European Central Bank has only 50 billion euros in reserves, which are provided by the central banks of each country based on their share of the euro zone ’s population and GDP.

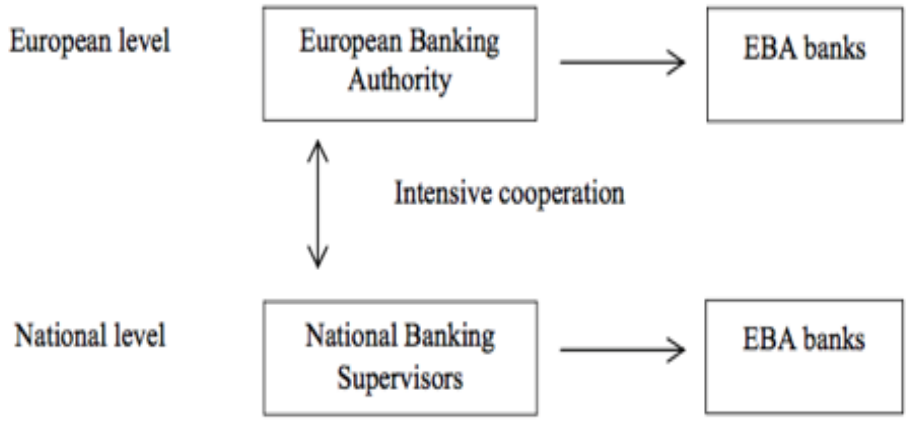
The integration of European banks is conducive to enhancing the competitiveness of European banks and promoting the integration of European financial markets and financial regulation. Bank expansion will help focus resources in areas that require large capital investments, such as technology upgrades and digital transformation. The European banking industry has integrated a rich portfolio of banks with different business models, legal forms and ownership structures. In addition to large commercial, retail and

investment banks focusing on hybrid banking, there are many specialized institutions with different ownership structures, such as public banks, cooperatives and savings institutions, which exist in highly diversified markets. Small and large banks, domestic and foreign banks, professional banks and universal banks have all contributed to a diversified, competitive and safe banking industry.

2.2.4 Regulation of Banking Sector in European Union

Generally, banking regulation is reflected in the establishment of certain rules related to the preservation of stability and minimizing bank risks. Over the past three decades, the regulation was based on the idea that markets are generally highly effective in sense of asset allocation and can be characterized as a self- regulating. This claim is based on the notion that in the absence of regulation, banks have an incentive to prevent their own bankruptcy, and the regulation was justified only in the case of major threats to the stability of the banking sector. However, due to the nature of the business, the banking sector is largely dependent on the trust of users. As for the problems of a single bank, due to the connection of the banking sector possible occurrence of a banking panic and a systemic crisis, we think the banking regulation is necessary in the context of a system stability and trust of clients. We can see Dual Approach for Supervising European Banks in the Figure 2.2.

Figure 2.2 Dual Approach for Supervising European Banks



Source: Schoenmaker D., 2012, Banking Supervision and Resolution: The European Dimension, DSF Policy Paper, No. 19, Duisenberg school of finance, p. 7

The picture above shows the relationship between European banking authorities and national banking institutions. EBA means the European Banking Authority , which could organise regulators into a similar committee. The ECB supervises banks to ensure

that they follow the rules set by the EBA, which emerged as part of the European Supervisory Authority (ESA), which also consists of the European Insurance and Occupational Pensions Authority (EIOPA). The EIOPA is responsible for protecting insurance policyholders, pension members, and beneficiaries.

In recent decades, there have been many administrative limitations in the practice of banking supervision, and the banking supervision authorities of various countries have great discretion. Only ten years ago, Europe still had such a situation: the market for financial products and services was divided by different laws and regulations; in order to prevent excessive competition, the establishment of branches must be approved; credit growth was controlled by prices and totals; The amount of loans needs to be approved one by one. The introduction of the Basel Committee ’s new capital agreement has had a major impact on bank supervision. With the promulgation of the new agreement, regulatory practice has paid more attention to the internal measurement and risk prevention procedures developed by banks to control risks. The new agreement promotes the continuous development, innovation and improvement of the bank's risk management, and at the same time provides CEBS with a good opportunity to complete the work of harmonizing the EU's banking supervision practices.

The European Committee of Banking Supervisors (CEBS) was established in November 2003. It is part of a unified and coordinated European financial regulatory framework (Lamfalussy framework), which is mainly responsible for the harmonization of EU banking supervision practices and the promotion of EU banks Supervisory authority cooperation. It is located at the third level of the framework with the European Commission for Securities Regulatory Authorities (CESR) and the European Commission for Insurance and Occupational Pension Supervision (CEIOPS) and is responsible for unifying the regulatory practices of various countries.

However, it is not difficult for us to find that CEBS faces four major challenges in the implementation of the new agreement: first, to ensure the consistency of the implementation of the new agreement by EU member states; second, to unify the regulatory practices related to the new agreement; third, to promote the supervisory authorities of the home country and the host country Cooperation to simplify the supervision procedures of cross-border banking groups; Fourth, to carry out effective consultation work and improve the quality of supervision standards.

2.3 Banking Sector in China

Apparently, the development of China's banking industry has experienced many

twists and turns due to the factors of the times. But now we look at the development of China's banking industry, it is still developing very well. The assets and after-tax profits of China's banking sector have been growing rapidly year by year, accounting for nearly a third of global banking profits in recent years. The scale of China's banking industry is developing rapidly, but under the background of accelerated interest rate liberalization, intensified internal and external competition and declining profit growth, Banks and financial institutions must make corresponding strategic adjustments in business structure, resource allocation and regional layout.

With the increasing competition in the banking industry, financial institutions in the banking industry pay more and more attention to the tracking research on the development environment of the industry and market demand, especially the in-depth research on the development environment of the banking business and the trend change of customer demand. Because of this, a large number of outstanding Chinese banking institutions are rising rapidly, gradually forming their own business characteristics and becoming the industry leaders or emerging stars.

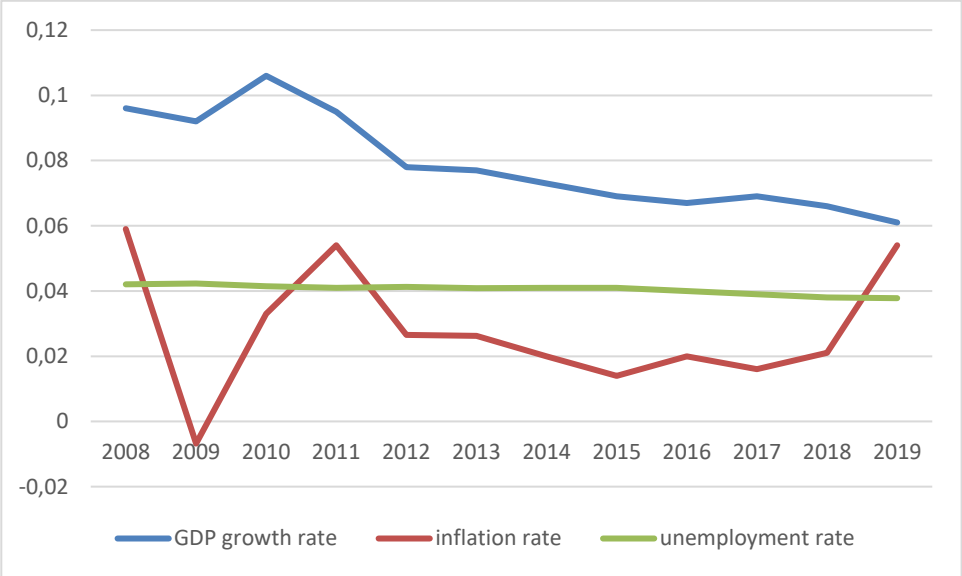
2.3.1 Basic Information of Macroeconomic in China

We know that China has always adopted a proactive economic policy in the face of the complicated external environment. Specifically, it can be expressed in four points:

- China should distinguish between monetary policy and credit policy. Credit policy affects corporate investment and resource allocation, while monetary policy affects the amount of money supply; the government’s monetary policy can be controlled by currency issuance and bank reserves Money supply.
- The abolition of price control is the main content of market reform, which helps to reflect the real price level and eliminate the imbalance of resource allocation and speculation; when the price is liberalized, the government's fiscal expenditure is applied to economic infrastructure, education, and health. And try to achieve a balanced budget.
- When the government decides to implement a low-inflation policy, wages cannot be linked to the price index, and the distribution of wages within an enterprise can take the form of profit sharing.
- The economic growth rate should not be too fast. China should pay attention to the growth potential of agriculture, service industry and light industry.

Affected by these economic policies, China's macroeconomic development is improving, as can be seen from the Figure 2.3.

Figure 2.3 The macroeconomic database in China



Source: own calculation (GDP data: kylc; inflation data: statista; unemployment data: finance.sina)

Unemployment has been a problem in China, a large developing country with a large population, and in the study of macroeconomics, the most important goal of macroeconomic policy is to see full employment with low inflation rate. In 2009, China's inflation rate fell to -0.68%, the lowest value in the past decade. But in 2010, the GDP growth rate was very high, reaching 10.64%.When inflation is high, unemployment is low; When inflation is low, unemployment is high. At present, the unemployment population in China is soaring and the employment pressure is increasing. Therefore, it is particularly important to achieve full employment under low inflation.

We can know that the management of unemployment in China is a comprehensive project. China has made many efforts at the micro level, such as guiding the selection of enterprise technology, strengthening the skills training of laborers, creating a good financing environment for enterprises, supporting SMEs, and improving Function of market intermediary. Macroscopic fiscal and monetary policies are also important, but they must be coordinated by microscopic entities. These views have reference value. Taking into account the reform of state-owned enterprises, poor resolution of property rights issues will lead to errors in micro-investment, unreasonable industrial structure, rigid employment system, and inefficient labor market. The promotion of enterprise reform and the establishment of a modern enterprise system are also a process of shaping the micro-subject.

2.3.2 History of Banking Sector in China

In fact, as early as the Tang Dynasty, China had a financial industry and old financial institutions appeared, but it did not develop into a modern bank. It was not until the twenty-five years of Daoguang (1845) and the twenty-eighth year of Daoguang (1848) that the British Liru Bank set up branches in Hong Kong and Shanghai. The real banks did not appear on the land of China. Therefore, the earliest banks in China were the product of foreign capitalism invading China.

Britain, France, the United States, Germany, Russia and Japan all have banks in China. In addition to China's foreign settlement and import and export credit business, these banks also issue bank notes and enslavement loans to China. They not only control China's financial market, but also once held China's financial lifeline. After every failure of the Qing government ’s external war, we will see loans from foreign banks to the Qing government. These high-interest loans allow the Qing government to survive and continue to serve as the imperialist rule tool in China. Continue to absorb the wealth of China's society and bring down China's national capital and financial system.

- **The banking industry during the Manchu government :**

We can see from the history that the late Qing government ruled, and the Qing government began to form its own banks. The Qing Bank was established in July of the thirty-fourth year of Guangxu (1908) in the Qing Dynasty. It was originally named the Hukou Bank of the Qing Government. In the thirty-two years of Guangxu (1906), the Qing Dynasty ’s Hukou was renamed the Dubu Branch So renamed the Qing Bank. The purpose of the establishment of the Daqing Bank is mainly to organize the currency system, coinage and issuance of currency, and act as a proxy for the treasury. Daqing Bank is China's first central bank and the second modern bank. However, the Qing dynasty was already crumbling at this time, and the modern banking system of Manchu had to face the collapse of its collapse soon after its establishment.

In short, in the late Qing Dynasty, traditional ticket numbers and Yinzhuang were still the mainstream of society. Although the state-owned and national capital modern banks have developed, their scale and influence are still very limited, and they cannot compete with foreign banks. China ’s financial lifeline is still controlled by imperialist financial predators.

- **Banking during the period of the Chinese Kuomintang :**

The banking industry in the era of the Nanjing National Government has made great progress compared to the era of the Manchu and Beiyang governments, and has a

more complete financial system. However, due to the dictatorship of the Kuomintang reactionaries and the interests of the big landlords, big bourgeoisie, and comprador bourgeoisie represented by the Kuomintang, the banking industry of the Kuomintang regime did not bring substantial benefits to the people. The fiat currency depreciated wildly, and the financial system was on the verge of collapse. However, the financial system of the Nanjing National Government has made active contributions to resist the infiltration and invasion of foreign capital.

- **New China's banking industry :**

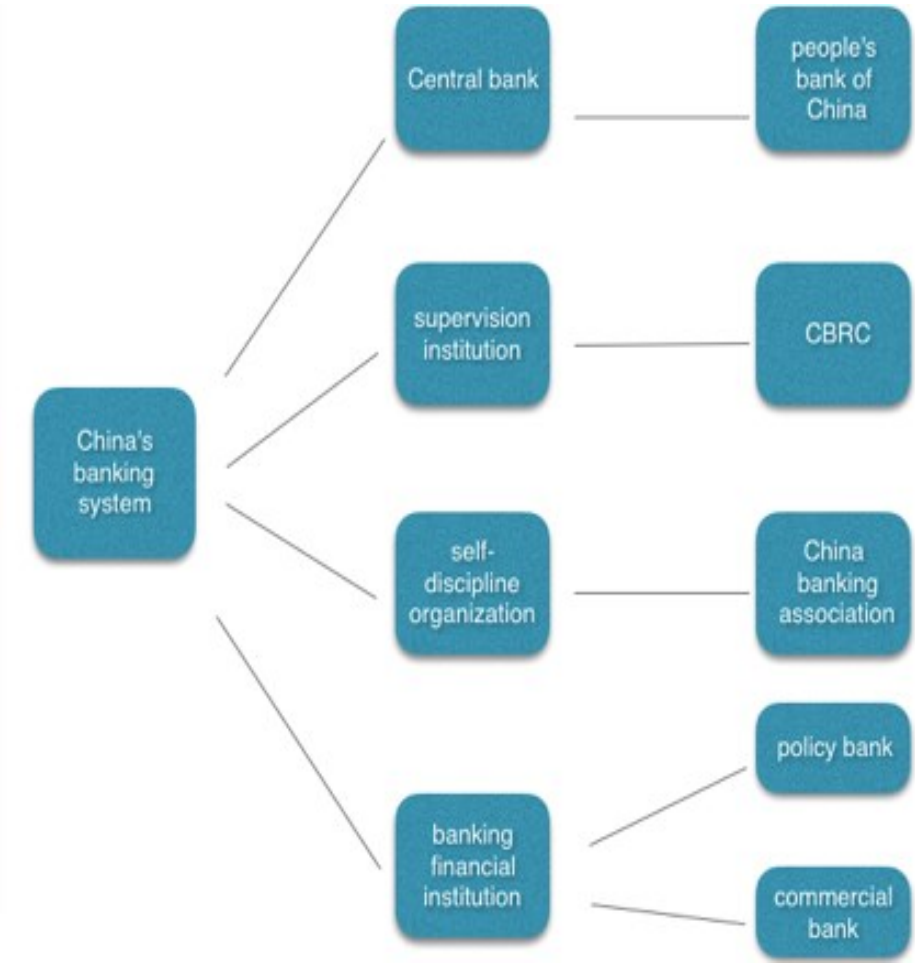
After the founding of New China, the government carried out a large-scale socialist transformation of the banking and financial systems of old China. Put the original bureaucratic capital bank under the control of the People's Bank of China. Among them, Bank of China and Bank of Communications were reorganized into long-term investment banks and professional foreign exchange banks according to their past business characteristics. By transforming the National Capital Bank and the private bank into a unified public-private joint bank, the city's financial system has been effectively transformed.

In rural areas, the government severely cracked down on usury activities in the countryside and established rural cooperatives on the basis of transforming old rural credit relations. This means that the socialist financial system has taken root in the vast rural areas of China. Around 1953, the new socialist new financial system in New China was basically formed. This played an important role in the recovery and development of the new economy of New China. More importantly, our motherland has since owned a complete set of The independent and systematic socialist banking system ended the history of the Chinese banking industry's dependence on foreign capital and bureaucratic capitalism.

2.3.3 Structure of Banking Sector in China

There is mainly one central bank in mainland China, the people's bank of China. And five major Banks in China refer to the five large state-owned Banks, including: industrial and commercial bank of China, agricultural bank of China, bank of China, China construction bank and bank of communications. The five major Banks in China are all large and comprehensive commercial Banks with extensive and diversified business coverage, representing the strongest capital and strength of China's financial sector. We can see the structure of Chinese bank by Picture 2.3.

Picture 2.3 The structure of Chinese bank



Sources: The People's Bank of China.

Central Bank The people's bank of China is the central bank of the People's Republic of China. Under the leadership of the state council, we will formulate and implement monetary policies to prevent and defuse financial risks and maintain financial stability. The Law of the People 's Bank of China on the People 's Republic of China establishes the status and responsibilities of the People 's Bank of China, which is the Central Bank of the People 's Republic of China. Under the leadership of the State Council, it formulates and implements monetary policies and supervises and manages the financial industry. It marks that China's central bank system has entered a stage of standardization, legalization, and modernization. In the socialist market economic system, the People's Bank of China has played a huge role in formulating and implementing monetary policies, conducting financial macro-control and supervising and managing the national financial industry effect.

Banking supervision is an important part of financial supervision. The arrangement of its structure should not only adapt to the overall development and

supervision of the financial industry, but also coordinate with market constraints and internal management of Banks. In fact, it is the result of balancing the cost and benefit of supervision. The establishment of the China banking regulatory commission (CBRC) shows the government's reform intention to improve the development level of the industry led by strengthening supervision. With the authorization of the state council, it shall uniformly supervise and administer Banks, financial asset management companies, trust and investment companies and other deposit-taking financial institutions, so as to maintain the lawful and stable operation of the banking industry.

In March 2018, according to the reform plan of the state council approved at the first session of the 13th National People's Congress, the China banking regulatory commission and the China insurance regulatory commission were integrated to form the China banking and insurance regulatory commission. The role of the China banking regulatory commission in drafting important laws and regulations on the banking and insurance industries will be assigned to the people's bank of China, and the China banking regulatory commission will no longer be retained.

The China banking association (CBA) aims at promoting the realization of the common interests of its members, performing the functions of self-discipline, rights protection, coordination and service, safeguarding the legitimate rights and interests of the banking industry, maintaining the market order of the banking industry, improving the quality of the employees in the banking industry, improving the level of service for its members and promoting the healthy development of the banking industry. Founded in 2000, the China banking association is a non-profit social organization voluntarily organized by commercial Banks and policy Banks registered in the People's Republic of China. Approved by the people's bank of China and registered in the civil affairs department, it is the self-regulatory organization of China's banking industry. The association and its business are subject to the guidance and supervision of the people's bank of China and the administration of the ministry of civil affairs. After the establishment of the CBRC in 2003, the competent unit of the China banking association was changed from the people's bank of China to the CBRC.

Policy Banks refer to professional financial institutions established by the government to carry out the government's economic policies and carry out financial business in specific fields without the purpose of making profits. It is an important part of China's financial system reform to separate policy-based finance from commercial finance, establish policy Banks, undertake strictly defined policy-based businesses, commercialize specialized Banks, develop commercial Banks, and vigorously develop commercial financial services to meet the needs of market economy. In 1994, the Chinese

government established three major policy Banks, the China development bank, the export-import bank of China and the agricultural development bank of China, all of which are directly under the leadership of the state council. In March 2015, the state council defined CDB as a development financial institution, separated from the policy bank.

Policy Banks are not for profit. They are specialized in carrying out and cooperating with the government's social and economic policies or intentions. They directly or indirectly engage in policy financing activities in specific business areas, serving as tools for the government to develop the economy, promote social progress and conduct macroeconomic management.

Commercial Bank (CB), a type of Bank, is a financial institution that ACTS as a credit intermediary through deposit, loan, exchange, deposit and other businesses. The main business scope is to absorb public deposits, make loans and deal with bill discount. Generally, commercial Banks do not have the right to issue currency. The traditional business of commercial Banks mainly focuses on deposit and loan business.

Also, we organized three main types of commercial Banks in China: First, state-owned commercial Banks: industrial and commercial bank of China, agricultural bank of China, bank of China, China construction bank and postal savings bank of China; Second, joint-stock Banks: bank of communications, China merchants bank, industrial bank, Huaxia bank, etc. Third, local commercial Banks: bank of Beijing, Xishang bank and other local city commercial Banks; Rural credit cooperatives, rural Banks and other rural commercial Banks.

2.3.4 Regulation of Banking in China

In China, the main banking regulator is the China banking regulatory commission (CBRC) was established on April 25, 2003. With the authorization of the state council, it shall uniformly supervise and administer Banks, financial asset management companies, trust and investment companies and other deposit-taking financial institutions, so as to maintain the lawful and stable operation of the banking industry.

The China banking regulatory commission includes the people's bank of China's supervision of banking financial institutions and the former central banking commission of the communist party of China (CPC). According to the decision of the CPC central committee, the China banking regulatory commission has set up a party committee to perform the functions prescribed by the CPC central committee.

Simply to say, the most important component of China's banking supervision is

the China Banking Regulatory Commission (CBRC). According to the authorization of the State Council, CBRC supervises and manages banks, financial asset management companies, trust and investment companies and other depository financial institutions in a unified manner to maintain the legal and stable operation of the banking industry.

And, we have summarized the main functions of the CBRC:

- Formulate supervisory rules and regulations governing the banking institutions;
- Authorize the establishment, changes, termination and business scope of the banking institutions;
- Conduct on-site examination and off-site surveillance of the banking institutions, and take enforcement actions against rule-breaking behaviors;
- Conduct fit-and-proper tests on the senior managerial personnel of the banking institutions;
- Compile and publish statistics and reports of the overall banking industry in accordance with relevant regulations:
- Provide proposals on the resolution of problem deposit-taking institutions in consultation with relevant regulatory authorities;
- Responsible for the administration of the supervisory boards of the major State-owned banking institutions; and Other functions delegated by the State Council.

As a member of the Financial Stability Board and the Basel Banking Supervision Committee, the China Banking Regulatory Commission participates in plenary meetings, working groups and research projects, participates in the setting of international financial regulatory reform agendas, sets standards and evaluates and implements them. It actively fulfills its international responsibilities and fully reflects China's national conditions. Reasonably draw on successful experience and continuously improve the prudential regulatory framework of the Chinese banking industry.

From this, we can see that it plays a very important role in establishing a complete and effective Chinese banking supervision and regulation system.

3 Description of the Evaluation Methodology of Banks

As we know, financial analysis is the key to determining the viability and potential profitability of any venture. In this chapter, we will describe the various financial indicators, which some will be subsequently selected and used in the next chapter for comparison of selected banks. Such as profitability ratio, liquidity ratio, activity ratios, marketability ratio, financial leverage ratio, asset quality ratios. These indicators are good credentials for measuring the operating status of banks.

3.1 Profitability Ratio

Profitability Ratios are that helps us understand whether the bank is able to generate enough sales relative to its expenses during a specified period. Most commonly used by Financial Analysts, Profitability Ratio analysis measure and evaluate a company's earning generation ability relative to its revenue and expenses during a specific time period. Profit is essentially whatever is left from the revenue after deducting all the associated expenses.

Profitability ratios types include gross profit margin, operating profit margin, net profit margin, EBITDA Margin, Earnings per share, ROE, ROCE, ROA, Contribution margin and more.

3.1.1 Return on Assets

Return on assets is an indicator used to measure how much net profit is created per unit of assets. A useful indicator of the company's profitability relative to its total asset value. It is generally expressed as a percentage.

ROA measures the profitability of banks in the industry. The higher the indicator, the better the effect of corporate asset utilization, indicating that the company has achieved good results in terms of increasing revenue and saving capital, otherwise. For strategic management purposes, bank management should pay close attention to this indicator. A company's total assets can easily be found on the balance sheet. The formula is following as:

$$ROA = \frac{net\ income}{total\ assets}. \tag{3.1}$$

This formula consists of net income and total assets. Net income refers to the income of the bank after deducting all additional expenses. These additional costs include

production, overhead costs, operations, management, debt repayment, taxes, amortization and depreciation. Banking regulators should also pay attention to ROA when conducting profitability analysis. The main purpose is to compare the indicator horizontally with banks in the same group, or vertically with the historical status of banks. However, the limitation of the average return on assets is that it does not reflect the cost of capital of the bank.

Return on average assets (ROAA) is a ratio used to assess the profitability of a bank's assets, and it is also known as simply return on assets(ROA).The formula is following as:

$$ROAA = \frac{net\ income}{average\ total\ assets}. \tag{3.2}$$

ROAA is calculated by dividing net income by average total assets. However, the limitation of the return on average assets is that it does not reflect the cost of capital of the bank.

3.1.2 Return on Equity

ROE is the percentage of net profit to the average shareholder ’s equity, which is the percentage of the bank’s after-tax profit divided by net assets. This indicator reflects the level of return on shareholder ’s equity and is used to measure the bank’s efficiency in using its own capital. The higher the indicator value, the higher the return on investment. This indicator reflects the ability of own capital to obtain net income. Return on equity can be expressed by the relation:

$$ROE = \frac{net\ income}{total\ equity}. \tag{3.3}$$

The calculation of the rate of return on net assets is flawed. The numerator is net profit, and the denominator is net assets. Since the company's net profit is not only generated by net assets, the calculation caliber of the numerator and denominator is not consistent, which is logically unreasonable. of. In addition, the rate of return on net assets can reflect the level of return on the bank’s net assets (equity funds), but it does not fully reflect a bank’s ability to use funds.

3.1.3 Net Interest Margin

Net interest margin is actually the rate of return of interest-earning assets, that is, the ratio of net interest income to the average size of interest-earning assets. Net interest

margin measures the ability of a bank 's interest-earning assets to earn interest income over a certain period of time. For commercial banks, the net interest margin is a key indicator of their interest-earning asset yield and risk pricing ability, and is also one of the core regulatory indicators of commercial banks. The formula is following as:

$$Net\ interest\ margin = \frac{interest\ income - interest\ expense}{total\ assets}. \quad (3.4)$$

Interest-earning assets refer to the assets formed by banks on the condition of charging interest to externally store and ship funds, so it not only includes various loans, but also includes depositing interbank funds, buying resale assets and depositing central bank funds. The larger the indicator, the greater the development potential of the enterprise and the stronger the market competitiveness, which is a manifestation of strong profitability.

In addition, the net interest margin will also be affected by other monetary instruments of the central bank. Generally speaking, other monetary policies of the central bank (such as the deposit reserve ratio, open market operations, etc.) determine the amount and cost of the base currency to the bank, by affecting the bank The cost of debt and the bank 's available funds affect the supply of bank credit and other assets, which affects the prices of assets and liabilities through adjustments in supply and demand, which in turn affects net interest margins.

3.1.4 Net Non-interest Margin

Net non-interest margin refers to the ratio of net non-interest income to profitable assets. It reflects the relationship between bank service income and non-interest costs, and indicates the profitability of bank financial service businesses. This ratio is calculated by formula:

$$Net\ noninterest\ margin = \frac{non\ interest\ income - non\ interest\ expense}{total\ assets}. \quad (3.5)$$

Non-interest income in the formula includes deposit service fees and other service income, such as commission income from commissions, income from exchange business, income from agency business, and so on. Non-interest expenses mainly include loan loss provisions, salary and welfare expenses, management expenses such as depreciation of fixed assets, and other expenses. This assessment index can reflect the management efficiency of the bank. Although some banks' fee income continues to increase as a percentage of their total revenue, their net non-interest returns are negative because they cannot keep up with the increase in non-interest costs.

3.1.5 Net Operating Margin

Net operating margin refers to the operating profit earned as a percentage of net sales or as a percentage of capital invested. This percentage can comprehensively reflect the operating efficiency of an enterprise or an industry. Operating profit margins vary greatly between industries and companies in the same industry, and not all companies can make profits every year. It is calculated by dividing a company's operating profit by its net sales.This ratio is calculated by formula:

$$Net\ operating\ margin = \frac{total\ operating\ revenues - tota\ loperating\ expenses}{total\ assets}. \quad (3.6)$$

Generally speaking, the number of sales, the average selling price of unit products and the manufacturing cost of unit products all affect this ratio. The higher the net operating margin, the greater the operating profit provided by the company's merchandise sales and the stronger the profitability of the company; conversely, the lower the ratio, the weaker the company's profitability.

3.1.6 Net Profit Margin

The net profit margin formula looks at how much of a company's revenues are kept as net income. The net profit margin is generally expressed as a percentage. Both net income and revenues can be found on a company's income statement. The net profit margin is calculated by formula:

$$Net\ profit\ margin = \frac{net\ income}{total\ operating\ revenues}, \quad (3.7)$$

Net profit margin can comprehensively reflect the operating efficiency of an enterprise or an industry. From the level of profits, it can be predicted that the economic development trend, profit growth, employment and income will generally increase, while profits decline, employment and income will also decrease. Profits encourage people to invest their savings in profitable businesses or industries. At the same time, profits also provide the largest source of funds for economic growth. Although the absolute value of profit may reach a new level every year, the profit rate may not necessarily increase continuously.

3.2 Liquidity Ratio

The liquidity ratio can measure the company's ability to repay short-term debt

obligations. As a matter of course, these ratios can measure the ability of banks to repay short-term debt when they are due. The liquidity ratio is similar to the fixed asset ratio. It represents the ratio of the company's current assets to owner's equity. There can be two calculation formulas. One is to divide the current assets at the end of the period by the owner's equity. The other is current assets divided by average owner's equity.

3.2.1 Loan to Deposit Ratio

The loan-to-deposit ratio is also an indicator to measure the bank's business capacity. It refers to the ratio of total bank loans to total deposits. From the perspective of bank profitability, the higher the loan-to-deposit ratio, the better, because deposits must pay interest, the so-called cost of funds. Less loans means higher costs, lower income, and poor profitability of banks. Since commercial banks are profit-making, it will try to increase the deposit / loan ratio. The LTD ratio can be calculated by the following formula:

$$Loan\ to\ deposit\ ratio = \frac{total\ loans}{total\ deposits}. \tag{3.8}$$

From the perspective of bank profitability, the higher the loan-to-deposit ratio, the better, because deposits are interest-bearing, the so-called cost of funds. If a bank has a lot of deposits and few loans, it means that it has high costs and low income , The profitability of banks is poor. Since the commercial bank is for profit, it will try to increase the deposit-loan ratio.

However, the ratio of deposits and loans should not be too high, because banks also have to pay their customers daily cash withdrawals and daily settlements. Therefore, when the loan-to-deposit ratio is too high, the bank needs to reduce the ratio. The specific method is very simple. One is to reduce loan increments, and the other is to increase deposit increments.

3.2.2 Current Ratio

The current ratio is the ratio of current assets to current liabilities. It is used to measure the ability of a bank’s current assets to become cash for debt repayment before the short-term debt expires. Generally speaking, the higher the ratio, the stronger the liquidity of the bank’s assets and the stronger the short-term solvency; otherwise, it is weaker.

The current ratio is used to measure the ability of a bank’s current assets to become

cash for debt repayment before the short-term debt expires. Although the higher the current ratio, the greater the liquidity of corporate assets. However, a large ratio indicates that the current assets occupy more, which will affect the operating capital turnover efficiency and profitability. Generally considered a reasonable minimum current ratio is 2.The formula is computed by:

$$Current\ ratio = \frac{current\ assets}{current\ liabilities}. \tag{3.9}$$

However, as mentioned earlier, banks with higher current ratios do not necessarily have a strong ability to repay short-term debt, because in current assets, although cash, securities and receivables have strong liquidity, inventory. And deferred charges. It is also a liquid asset, and the liquidation time is long, especially the inventory is likely to be backlogged, unsaleable, defective, returned, etc., and has poor liquidity.

Generally speaking, the higher the ratio, the stronger the liquidity of the bank's assets and the stronger the short-term solvency; otherwise, it is weaker. It is generally believed that the current ratio should be above 2: 1 and the current ratio is 2: 1, which means that current assets are twice the current liabilities. Even if half of the current assets cannot be realized in the short term, all current liabilities can be guaranteed to be repaid.

3.2.3 Quick Ratio

The quick ratio is an indicator of a company's short-term liquidity position and measures a company's ability to meet its short-term obligations with its most liquid assets. It is used as one of the indicators to measure the liquidity of company assets. Reflects the company's ability to repay current liabilities with cash or realizable assets. The formula used to calculate the quick ratio is:

$$Quick\ Ratio = \frac{cash\ equivalents + short\ term\ investments + account\ sreceivable}{current\ liabilities}. \tag{3.10}$$

There is no precise definition of the pros and cons of the quick ratio. Under normal circumstances, the company's quick ratio is 1, and the quick ratio below 1 is considered to be short-term solvency. But this is only a general view, because different industries, the quick ratio will be very different, there is no unified standard quick ratio. If the ratio is too high, it means that the company has excess liquidity and production capacity problems; if the ratio is too low, it means that the company's current debt is too heavy and there may be repayment risks.

3.2.4 Net Stable Funding Ratio

The net stable funds ratio is defined as the ratio of the stable funds available at any time to the minimum stable funds required by the relevant regulations. Apparently, the net stable fund ratio was proposed by the Basel committee in its revised draft of Basel III: net stable fund ratio in January 2014.This ratio should be equal to at least 100%, the formula is following as:

$$NSFR = \frac{available\ amount\ of\ stable\ funing}{required\ amountofs\ table\ funding} \geq 100\%. \tag{3.11}$$

The significance of this formula: It is used to measure the ability of a bank to use a stable source of funds for a longer period of time to support the development of its on- and off-balance sheet assets. The numerator of this ratio is the stable source of funds available to the bank, and the denominator is the stable source of funds required by the bank to develop various asset businesses.

The coefficients of various liabilities and asset items in the numerator and denominator are determined by the regulatory authority. Setting a minimum regulatory standard for this ratio helps promote the use of stable funding sources to support the development of its asset business and reduce the maturity mismatch of assets and liabilities.

3.3 Activity Ratio

An activity ratio is one of several accounting ratios that measure how quickly a company can convert certain of its assets into cash, or revenue. Three commonly assessed activity ratios are the asset turnover ratio, operating efficiency ratio and the receivables turnover ratio. An activity ratio, along with other accounting ratios, is used in fundamental analysis to determine the relative strength of a company compared to its competitors. The information used to calculate an activity ratio is found on a company's balance sheet or income statement.

3.3.1 Asset Turnover Ratio

The total asset turnover ratio is a very important indicator for investigating the operating efficiency of an enterprise 's assets, reflecting the flow rate of all assets from input to output during the operation of the enterprise, and reflecting the management quality and utilization efficiency of all assets of the enterprise. The formula is following

as:

$$Asset \quad turnover\ ratio = \frac{total\ operating\ revenues}{total\ assets}. \tag{3.12}$$

The asset turnover ratio is calculated on an annual basis. The total assets number used in the denominator can be calculated by taking the average of assets on the balance sheet at the beginning of the year and at the year's end.

Through the comparative analysis of this indicator, it can reflect the operating efficiency and changes of the company's total assets in this year and previous years, and find the gap between the company and similar companies in the use of assets, which promotes the company to tap the potential, actively generate income, and improve the product market share. It also improves the efficiency of asset utilization. Generally, the higher the value, the faster the turnover of the bank's total assets. The stronger the sales ability, the higher the efficiency of asset utilization.

3.3.2 Operating Efficiency Ratio

Operating efficiency ratio, also known as a working ratio, reflects the level of business efficiency and whether various resources are fully utilized. A estimate of efficiency is determined by dividing the operating expenses by its revenue. This figure is converted into a certain proportion, the lower the proportion, the greater the organization's ability to make profit if revenues decrease. The formula is followed as:

$$Operating\ efficiency\ ratio = \frac{total\ operating\ expenses}{total\ operating\ revenues}. \tag{3.13}$$

This ratio reflects the level of business efficiency and whether various resources are fully utilized.

3.4 Marketability Ratio

This is a method of assessing the ability to buy and sell financial assets such as securities. That employment means that it measures the performance and attractiveness of securities in financial markets. Marketability is similar to liquidity, except that liquidity implies how to retain the value of the securities, but marketability only indicates that securities can be bought and sold. Shareholders and investors are usually interested in the market price of a company's stock. The marketability ratio is often used as earnings per share and price-earnings ratio.

3.4.1 Earnings Per Share

Earnings per share (EPS) is the final result of the company's profitability. The high profit per share represents the company's high profitability per unit of capital, which means that the company has some better capabilities-product marketing, technical capabilities, management capabilities, etc., so that the company can create less resources Higher profitability. The formula is following as:

$$Earnings\ per\ share = \frac{net\ income - dividends\ on\ preferred\ stock}{average\ oustanding\ shares}. \tag{3.14}$$

If we want to calculate the bank 's earnings per share, we also need the bank 's balance sheet and profit and loss statement to determine the number of common shares at the end of the period, the dividend paid by the preferred stock dividend, and net income or net profit. It is best to use the weighted average number of ordinary shares during the reporting period, because the number of shares will change over time, and the weighted average method is more accurate.

Earnings per share usually also represent dividends that can be distributed in that year. If you choose stocks from the perspective of dividend income, you can use earnings per share as a surrogate variable.

3.4.2 Price-Earnings Ratio

The price to earnings ratio (P/E ratio) is the ratio of market price per share to earning per share. The P/E ratio is a valuation ratio of a company's current price per share compared to its earnings per share. It is also sometimes known as "earnings multiple" or "price multiple". Though Price-earning ratio has several imperfections but it is still the most acceptable method to evaluate prospective investments. It is calculated by dividing "Market Value per Share" to "Earnings per Share ". The formula is following as:

$$Price - Earnings\ ratio = \frac{market\ value\ per\ share}{earnings\ per\ share}. \tag{3.15}$$

The P/E ratio tells how much the market is willing to pay for a company's earnings. A higher P/E ratio means that the market is more willing to pay for the earnings of the company. Higher price to earnings ratio indicates that the market has high hopes for the future of the share and therefore it has bid up the price. On the other hand, a lower price to earnings ratio indicates the market does not have much confidence in the future of the share.

The average P/E ratio is normally from 12 to 15 however it depends on market and economic conditions. P/E ratio may also vary among different industries and companies. P/E ratio indicates what amount an investor is paying against every dollar of earnings. A higher P/E ratio indicates that an investor is paying more for each unit of net income. So P/E ratio between 12 to 15 is acceptable.

3.5 Financial Leverage Ratio

Financial leverage refers to the means by which companies use liabilities to regulate equity capital gains. Financial leverage ratio refers to the ratio that reflects the company's debt financing. Financial leverage allows companies to control resources greater than their equity capital. For listed companies, financial leverage is a double-edged sword. If the return on investment is higher than the cost of debt, the increase in financial leverage will increase the company's return on net assets; on the contrary, if the company fails to pay its debts on time, it will face the threat of a financial crisis.

3.5.1 Equity Multiplier

The equity multiplier is positively related to bank efficiency. The equity multiplier is the asset-to-capital ratio. It represents the operating efficiency of bank capital, and measures how many times a certain amount of capital can create assets. It is calculated by dividing a company's total asset value by total net equity. The formula is computed by:

$$Equity\ multiplier = \frac{total\ assets}{total\ \ equity}. \tag{3.16}$$

As can be seen from this formula, a higher equity multiplier means that debt in total assets is increasing, which means that the company has greater financial leverage. Companies with higher debt burdens will have higher debt service costs, which means that they will have to produce more cash flow to maintain optimal operating conditions so that they can increase revenue. Therefore, the equity multiplier is the change in the debt ratio.

3.5.2 Risk Index

The systemic risk index of the bank's wealth management product market is weighted by three types of indexes: the risk index of the investing party, the risk index of the bank's financial institution, and the risk index of the source of the fund. It based on

return on assets. This indicator indicates the financial stability of banks and the stability of earnings. It's a simple represent of bank risk. Risk index can be expressed by the following formula:

$$RI = \frac{E(ROA) + CAP}{S_{(ROA)}}. \tag{3.17}$$

E(ROA) is expressed expected return on assets, which can be clearly expressed by the following relationship:

$$E(ROA) = \frac{\sum ROA}{n}. \tag{3.18}$$

Among them, CAP represents the equity share in the bank's assets, referred to as capitalization, CAP can be calculated using the following formula:

$$CAP = \frac{E}{A}. \tag{3.19}$$

Then $S_{(\mathrm{ROA})}$ means the volatility of the return on assets, we can use the following formula:

$$S_{(ROA)} = \sqrt{\sum_{i=1}^{n} (ROA_i - \overline{ROA})^2}\ , \tag{3.20}$$

$\overline{ROA}$ is the average profitability of the bank, ROA_i means the profitability of the bank in year i, these two indicators can be calculated by the following formula:

$$\overline{ROA} = \frac{\sum_{i=1}^{n} ROA_i}{n}, \tag{3.21}$$

3.5.3 Capital Adequacy Ratio

Capital adequacy ratio is the ratio of a bank ’s total capital to its risk-weighted assets. National regulators track the CRAR of a bank to ensure that the bank can absorb a certain amount of risk. The capital adequacy ratio is the capital ratio necessary to ensure the normal operation and development of financial institutions such as banks. Financial management authorities in various countries generally have controls on the capital adequacy ratio of commercial banks, the purpose of which is to monitor the ability of banks to resist risks. The capital adequacy ratio has different calibers. The main ratios are the ratio of capital to deposits, the ratio of capital to liabilities, the ratio of capital to total assets, and the ratio of capital to risk assets. CAR can be expressed by the follow：

$$CAR = \frac{tier\ 1\ \text{capital} + tier\ 2\ \text{capital}}{risk\ weighted\ assets}. \tag{3.22}$$

Also, we all know: Tier 1 Capital = Common Equity Tier 1 + Additional Tier 1,Total Capital = Tier 1 Capital + Tier 2.Capital Risk-weighted exposures include weighted sum of the banks credit exposures (including those appearing on the bank's balance sheet and those not appearing). The weights are determined in accordance with the Basel Committee guidance for assets of each credit rating slab.

3.5.4 Probability of Financial Insolvency

The probability of financial insolvency P (BV) is used to calculate the probability of bankruptcy accounting. This indicator uses the previous risk index to estimate the probability that the bank will have a negative net worth. The formula is as follows:

$$P(BV) = \frac{1}{2 \cdot RI^2}, \tag{3.23}$$

where RI is the value of risk index. If the calculated value of this indicator is very high, it indicates that it has a great possibility of financial bankruptcy.

3.5.5 Core Tier 1 Capital Ratio

Core capital is also called Tier 1 capital and equity capital, including common stock, surplus, preferred stock, undistributed profit, and storage account. The bank's capital adequacy ratio required by the Basel Committee requires a capital adequacy ratio of 8% and a core capital adequacy ratio of 6%.It can be calculated by the following formula:

$$Core\ Tier\ 1\ \text{ratio} = \frac{tier\ 1\ \text{capital}}{risk\ weighted\ assets}. \tag{3.24}$$

Core capital includes equity capital and public reserves. Among them, equity capital includes issued and fully paid ordinary shares and non-cumulative preferred shares, which have a great impact on the profitability and competitiveness of banks.

According to Basel III, banks and financial institutions must maintain a minimum tier one capital ratio to ensure that unexpected losses are prevented. As mentioned earlier, for example, the losses that occurred during the 2008 financial crisis have a minimum tier 1 capital ratio of 6%.

3.5.6 Tier 1 Leverage Ratio

The Tier 1 leverage ratio is the ratio that is most strongly associated with the true amount of capital that is being leveraged and therefore is a good way to understand a banks current leverage. Tier 1 Leverage ratio defines the connection between a banks adjusted total assets (average total consolidated assets) and it's core capital. It is generally calculated using the following formula:

$$Leverage\ ratio = \frac{tier\ 1\ capital}{total\ adjusted\ assets}. \tag{3.25}$$

Generally speaking, the primary currency leverage ratio will be used by the central monetary authority as a tool to ensure the bank 's capital adequacy ratio and to restrict the extent to which financial companies can use their capital base.

3.6 Asset Quality Ratios

Asset quality ratio refers to the ratio of overdue loans, attention loans, subprime loans, doubtful loans, loss loans and the total assets or the balance of loans in the reporting period.

3.6.1 Non-performing Loan Ratio

A nonperforming loan (NPL) refers to the proportion of non-performing loans of financial institutions in the total loan balance. Non-performing loans refer to the classification of loans into normal, attention, substandard, suspicious and loss based on risk basis when evaluating the quality of bank loans. The latter three types are collectively called non-performing loans. The formula is computed by:

$$NPL\ ratio = \frac{nonperforming\ loans}{total\ loans}. \tag{3.26}$$

The International Monetary Fund considers loans that are more than 90 days past due as nonperforming if there's high uncertainty surrounding future payments.

We conclude that non-performing loans can be divided into three categories. The first is concern loans. It is defined as that although the borrower is currently capable of repaying the principal and interest of the loan, there are some factors that may adversely affect the repayment. A secondary loan is defined as an obvious problem with the borrower 's ability to repay the loan, which is entirely dependent on its normal operating income and cannot fully repay the principal and interest of the loan. Even if the guarantee

is executed, it may cause certain losses. The second is the suspicious loan, which is defined as the borrower is unable to repay the principal and interest of the loan in full. Even if the guarantee is executed, it will definitely cause greater losses. The last is a loss-type loan, which is defined as after all possible measures or all necessary legal procedures, the principal and interest can still not be recovered, or only a small part can be recovered.

3.6.2 Allowance to Total Loans Ratio

Allowance to total loans ratio is actually the withdrawal ratio of bad debt reserves; it refers to the ratio of loan loss provision balance to loan balance, and is one of the important regulatory indicators reflecting the level of provision of commercial banks. The formula is computed by:

$$Allowance\ to\ total\ loans\ ratio = \frac{allowance\ for\ loan\ loss}{total\ loans}, \tag{3.27}$$

where allowance is for loan loss which as an item on a bank's income statement that accounts for suffering a loss when people or companies that borrow from the bank default on their loans, and the bank will make a provision to cover its loss.

3.6.3 Coverage Ratio

Coverage ratio is the ratio of the use of reserve for bad debts and bad debts that may actually occur to bank loans. The provision coverage ratio of non-performing loans is an important indicator for measuring the adequacy of loan loss provision for commercial banks. This indicator reflects the risk of bank loans and the social and economic environment, integrity and other aspects from a macro perspective. The formula is following as:

$$Coverage\ ratio = \frac{ALL}{NPL}. \tag{3.28}$$

Among them, the best state of this ratio is 100%. Provision coverage ratio is an important indicator for banks. This indicator examines whether the bank’s finances are healthy and whether risks can be controlled.

4 Comparison of Banking Industry in Europe and China

In this chapter, some selected indicators will be used to compare selected banks, which have been introduced in detail in the previous chapter. There are five parts in this chapter. The first part will be the indicators defined according to profitability, collectively referred to as profitability ratio. The second part is the liquidity ratio. The third part will focus on the activity ratio. The fourth part will talked about financial leverage ratio . The fifth part of this chapter will focus on asset quality ratio .

These selected banks were evaluated from 2014 to 2019. According to the bank's total assets ranking, the eight selected banks are all selected from China and the European Union. We can see Tab.4.1 below.

Tab. 4.1 Total assets of selected bank in China and European Union from 2013 to 2019 in €m

	2013	2014	2015	2016	2017	2018	2019
ICBC	2,407,635	2,622,999	2,826,606	3,071,915	3,320,060	3,525,280	3,655,885
CCB	1,955,253	2,130,996	2,335,491	2,668,224	2,815,953	2,955,744	3,074,075
ABC	1,853,439	2,033,162	2,264,457	2,490,843	2,679,638	2,877,694	3,052,447
PBOC	1,780,376	1,957,086	2,157,809	2,328,900	2,498,097	2,729,057	2,857,219
Deutsche bank	1,611,400	1,708,703	1,629,130	1,590,546	1,474,732	1,348,137	1,345,860
BNP PARIBAS	1,800,139	2,077,758	1,994,193	2,076,959	1,960,252	2,141,625	2,244,887
HSBC	2,473,671	2,439,243	2,231,369	2,374,986	2,332,095	2,368,852	2,453,958
Crédit Agricole Group	1,890,386	1,955,887	1,572,486	1,561,917	1,583,717	1,776,469	1,783,786

We choose four large banks in China: they are Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), and Agricultural Bank of China (ABC) and Bank of China. And we choose four large banks in European Union, they are Deutsch bank, BNP PARIBAS, HSBC and Crédit Agricole Group.

4.1 Briefly Introduction of Selected Banking

Industrial and Commercial Bank of China (abbreviated as ICBC) was established on January 1, 1984. ICBC is a large state-owned bank managed by the central government and a deputy ministerial unit of the state. The basic tasks of ICBC are to raise social funds through domestic and foreign financing activities in accordance with national laws and regulations, strengthen credit fund management, support corporate production and technological transformation, and serve China’s economic construction.

After continuous efforts and steady development, Industrial and Commercial Bank of China has entered the ranks of the world's leading banks, with a high-quality customer base, diversified business structure, strong innovation capabilities and market competitiveness. The Bank regards service as the foundation of its establishment, insists on creating value with services, and provides comprehensive financial products and services to 7.033 million corporate customers and 607 million individual customers worldwide. The Bank consciously integrated social responsibility into its development strategy and business management activities, and was widely praised in terms of developing inclusive finance, supporting targeted poverty alleviation, protecting environmental resources, and supporting public welfare undertakings.

China Construction Bank (CCB) was established on October 1, 1954. China Construction Bank's main business areas include corporate banking, personal banking and treasury. It has branches and subsidiaries in 29 countries and regions, and has funds, leases, trusts, life insurance, property insurance, investment banking, futures, and pension funds. And other subsidiaries.

China Construction Bank has an extensive customer base, maintains banking relationships with a number of large enterprise groups and leading enterprises in China's economic strategic industries, and its marketing network covers major regions of the country.

Agricultural Bank of China (ABC) was founded in 1951. Agricultural Bank of China is an important part of China's financial system. It provides a variety of corporate and retail banking products and services. It also conducts financial market business and asset management. The business scope also covers investment banking, fund management, financial leasing, life insurance, etc. field.

Agricultural Bank of China, through 24,064 branches nationwide, 30,089 ATMs and 1,171 overseas agent banks around the world, provides the most extensive network of outlets and leading information technology advantages to more than 350 million customers worldwide Convenient, efficient and quality financial services.

The People's Bank of China (PBOC), main business is commercial banking, including corporate, personal finance, treasury and financial institutions. The company's business is based on credit products and is committed to providing customers with personalized and innovative financial services and financing and financial solutions. Personal finance business is mainly aimed at the financial needs of individual customers, providing services including savings deposits, consumer credit and bank cards. Treasury operations include domestic and foreign currency value preservation, fund management,

debt value preservation, domestic and foreign financing and other capital operation and management services.

The financial institution business is to provide comprehensive services such as fund clearing, interbank lending and custody for other banks, securities companies and insurance companies around the world. As a century-old brand in China's financial industry, Bank of China has been aggressive and innovative while focusing on stable operation, creating many firsts in the domestic banking industry, and has been widely recognized by the industry and customers in the fields of international settlement, foreign exchange funds and trade financing praise.

Deutsche Bank is a privately held joint-stock company. It is Germany's largest bank and one of the world's leading financial institutions. It is headquartered in Frankfurt am Main. Its shares are traded on all German exchanges and listed on Paris, Vienna, Geneva, Basley, Amsterdam, London, Luxembourg, Antwerp and Brussels. At the end of 1995, the shareholders of Deutsche Bank had 286,000 shareholders from all walks of life. As of 2017, the total number of Deutsche Bank Group is 97,535, providing services to approximately 8 million customers, including individuals, companies, government agencies, banks and public institutions from all over the world. Deutsche Bank has assets of more than 996 billion marks, about RMB 4.200 billion.

Deutsche Bank also conducts settlement operations, issues securities, processes letters of credit, guarantees, tenders and performance guarantees, and arranges financing. International trade financing is also an important business of the bank, often providing long-term credit alone or in conjunction with other syndicates and special financial institutions. Project finance, transit leasing and other financial instrument businesses greatly complement traditional trade finance. In terms of project financing, Deutsche Bank is increasing its emphasis on communications, transportation, energy and infrastructure projects, and its securities issuance business is very developed. It has become one of the world's leading securities issuers, participating in Germany and the world. Issuance of many important bonds and stocks in the market, often as lead and joint lead banks.

BNP Paribas is Europe's premier global bank and financial services institution, and was named one of the world's four largest banks by Standard & Poor's. The Group's business covers more than 85 countries around the world, and it steadily occupies important positions in corporate and investment banking, asset management and services, and retail banking.

In May 2000, two major commercial banks in France merged formally, and the

name of the merger was BNP Paribas. It ranks first in France according to its net income ranking and the fourth largest bank in Europe according to its shareholder equity ranking. Its capital market value ranks second among Eurozone banks. By the end of 1999, BNP Paribas had total assets of 699 billion euros and a profit of 1.5 billion euros. The number of employees exceeds 77,000, of which 28,000 are working overseas.

BNP Paribas has a large international network covering 83 countries, including seven major financial centers. BNP Paribas has real financial innovation capabilities and is experienced in new technologies and sales channels. Through continuous development and expansion of commercial and financial services, BNP Paribas has become a truly international bank and has achieved outstanding results in corporate banking, capital markets, international private banking, and asset management. In France, its advantages in providing services to corporate and private clients are unparalleled, especially in the areas of asset management, consumer credit, leasing and real estate.

HSBC Group is headquartered in London. HSBC Group is one of the world's largest banks and financial institutions. The HSBC Group has approximately 9,500 affiliates in 76 countries and regions in Europe, Asia Pacific, America, Middle East and Africa. HSBC is listed on stock exchanges such as London, Hong Kong, New York, Paris and Bermuda. There are approximately 200,000 shareholders worldwide, distributed in more than 100 countries and regions. There are 232,000 employees. HSBC has more than 110 million customers worldwide.

The HSBC Group is formed by the Hongkong and Shanghai Banking Corporation after many years of expansion. The Hongkong and Shanghai Banking Corporation opened in March 1865 in Hong Kong. In the same year, it opened branches in Shanghai and London, and set up an agency in San Francisco. Today, HSBC provides comprehensive personal wealth management services for up to 120 million individual clients, including current and savings accounts, mortgages, insurance, credit cards, loans, pensions, and investments. Under the global development trend, the consumer financing business has gradually become part of the personal finance business. Direct selling channels are also becoming more and more popular. In 2005, HSBC handled 183 million online transactions and 1.3 million outstanding financial customers.

Crédit Agricole is the largest bank in France with a capital of nearly 100 billion US dollars. It was founded in August 1920 on the basis of French local credit cooperatives and regional vaults. It was originally called the "National Agricultural Credit Administration", and was renamed "National Agricultural Credit Treasury" in 1926. name. The head office is located in the capital Paris. In 1986, there were 12030 branches.

In 1993, the total assets were US $ 29.204 billion, ranking first among French banks and seventh among the world 's 1,000 largest banks.

In 1885, in order to solve the problem of short-term capital turnover, French farmers established a local bank of agricultural credit with mutual assistance. In 1920, the French government established the National Agricultural Credit Authority, which was renamed the National Agricultural Credit Treasury in 1926. The structure of the French agricultural credit bank is pyramidal. The bottom layer is 3,09 local vaults, the middle is 94 regional vaults (1 per province), and the upper layer is the national agricultural credit vault. The National Agricultural Credit Treasury is an official institution and a bridge linking the state and agricultural mutual credit organizations. It is under the dual leadership of the French Ministry of Agriculture and the Ministry of Finance and Economy.

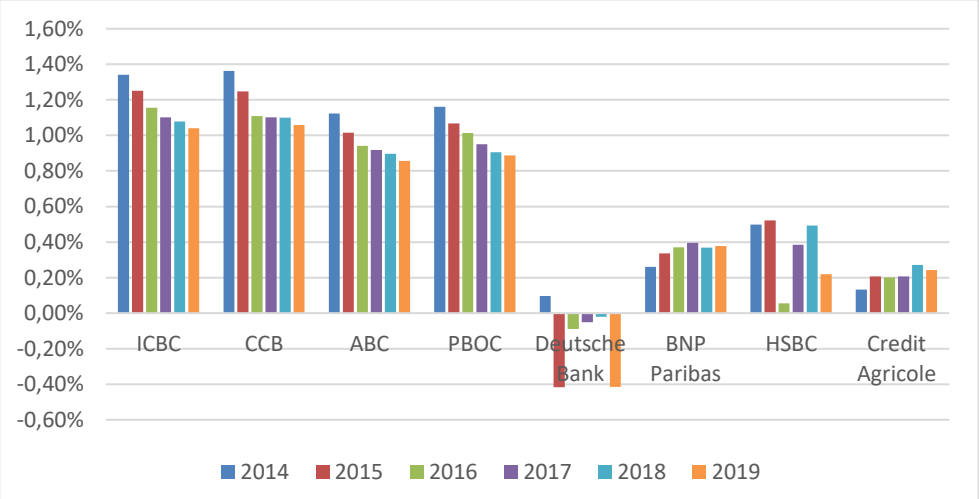
4.2 Profitability Ratios

The profitability ratios are used to simply measure profitable of a bank, which is relative to its total assets or equity. The profitability ratio should be compared with the relevant time period. And we chose 2008 to 2012 periods to compare the selected banks.

4.2.1 Return on Assets of Selected Banks

Return on assets (ROA) is an indicator used to measure how much net profit is created per unit of assets. And we calculate by formula (3.1), the result sees Figure 4.2.

Figure 4.2 ROA of selected bank （%）



From this figure, we can see that the profitable of Chinese banks is better than European banks. From 2014 to 2019, according to public data, the operating income from

high to low is as follows: ICBC achieved 362.151 billion yuan, CCB achieved 320.388 billion yuan, Agricultural Bank of China achieved 276.953 billion yuan and Bank of China achieved 248.236 billion yuan. Corresponding net profit was 152.995 billion yuan, 138.839 billion yuan, 108.953 billion yuan and 103.690 billion yuan. The year-on-year growth was 1.85%, 3.69%, 3.28%, and 11.45% respectively. Accordingly, among the four major banks, ICBC's net profit grew the lowest year-on-year, and Bank of China's year-on-year growth was far ahead. On the other hand, profitability is reflected in the annualized average return on assets, from high to low: CCB 1.30%, ICBC 1.24%, Bank of China 1.18%, and ABC 1.08%. From the perspective of the growth rate of net profit, among the four major banks, ICBC's net profit grew the lowest year-on-year, and PBOC's year-on-year growth was far ahead.

From 2014 to 2019, China's banking industry developed rapidly, and ROA data was exceptionally dazzling, but eventually it had to face the challenge. I personally summarized four main reasons:

1. the continued macroeconomic downturn and the weak demand for physical financing,
2. the liberalization of interest rates led to a comprehensive reduction in the scope of banking business,
3. industry competition and the decline in due profits Internet financial shocks,
4. regulatory policies, MPA assessments, etc. limit the speed of bank asset expansion.

For the above four reasons, Chinese banks continue to break through themselves during the challenge, but the profit margin remains within a stable range.

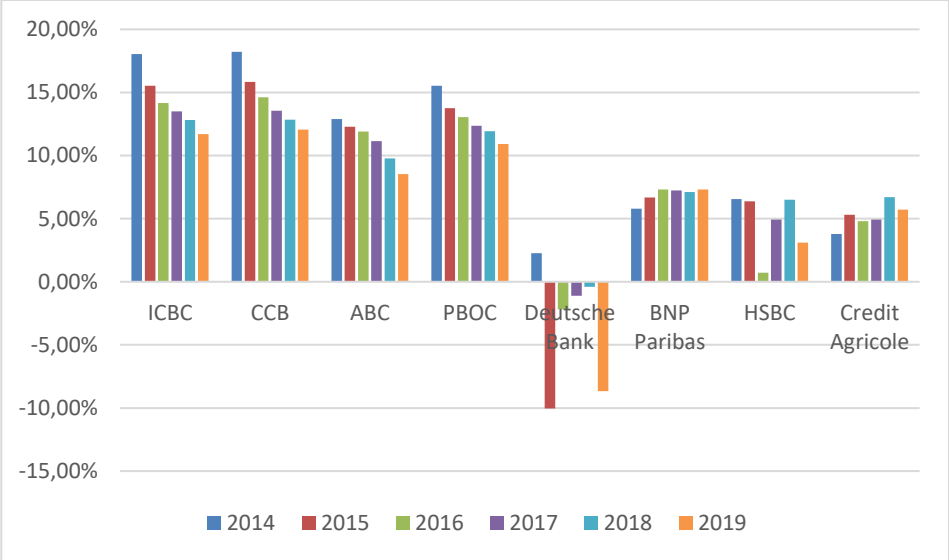
In contrast to European banks, Deutsche Bank's ROA has been negative, with only -0.42% in 2019. We can also see that 2018 is also very low. The 2018 annual financial report attributable to ordinary shareholders' net profit was 267 million euros, an increase of 135.55% year-on-year; operating income was 25.316 billion euros, a year-on-year decrease of 4.28%. However, Deutsche Bank CEO Ackerman recently said that considering stricter financial regulations, the overall profitability of the banking industry will decline.

4.2.2 Return on Equity of Selected Banks

ROE is net income divided total equity. It represent the overall profitability of own resources, and it can assess profit. And we can calculate this ratio by formula (3.3).

The result of selected bank we can see Figure 4.3.

Figure 4.3 ROE of selected bank （%）



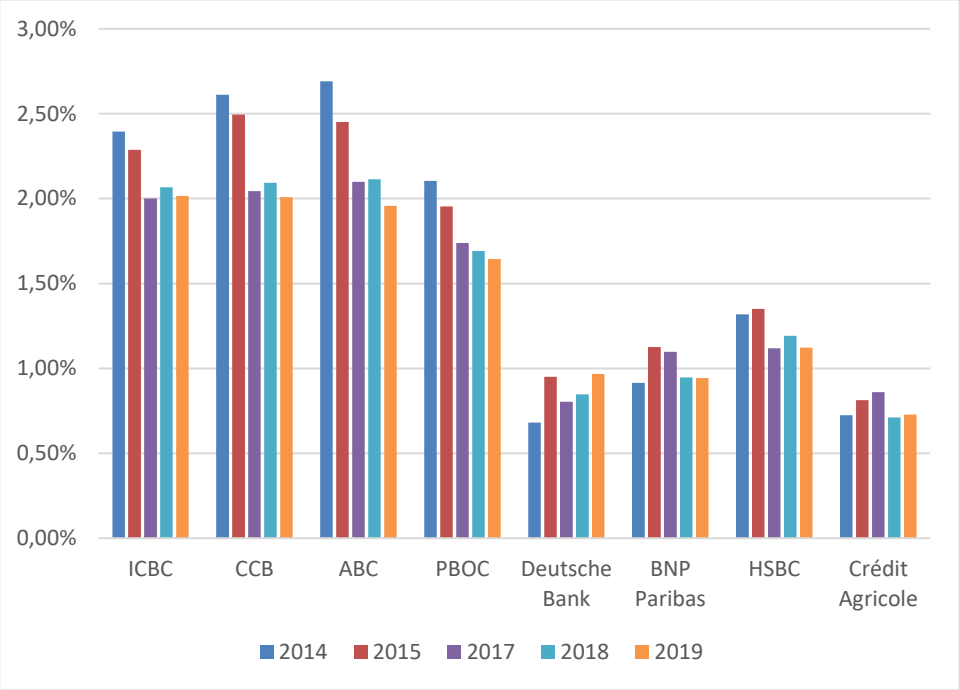
From the data of 2014 to 2019, the ROE of the Chinese banking industry is significantly higher than that of the European banking industry, but the gap gradually decreased after reaching the maximum in 2015. Deutsche Bank is only -10.05% . Based on a comprehensive analysis of ROE analysis, the profitability of China's banking industry is not outstanding, at the level of the global midstream, but it appears higher than the ROE level of Europe. Based on the relationship between ROE and equity multiples, we can attribute this difference to the higher leverage ratio of the Chinese banking industry than the European banking industry. in.

We can see that the transition of China's banking industry from high-speed growth to high-quality development has continued to narrow the decline in ROE, and is expected to start a rebound trend in the future. On the one hand, in the context of strict MPA supervision and strong capital constraints, the extensive model of the banking industry relying on scale growth to drive performance growth is gradually transforming into a refined development model of intensive endogenous capital growth. And on the other hand, we focus on the banks from European union, and obviously, the HSBC is a leader in banking industry in European Union, and it did a good performance from 2014-2019, but we can see the lowest ROE is -8.67% of Deutsch bank in 2019. According to European Banking Federation data, the average ROE of the EU banking industry in 2017 was 5.6%, only slightly higher than the half of the 10.6% level in 2014, and also lower than the Chinese banking industry14 %. Due to weak market performance and stricter European regulations, there are still many areas for improvement in the European banking industry.

4.2.3 Net Interest Margin of Selected Banks

Net interest margin measures the difference between interest income created by banks or other financial institutions. And we can calculate it by formula (3.4), the result we can see in Figure 4.4.

Figure 4.4 Net interest margin of selected bank （%）



From this figure we can see the interesting difference between Chinese banks and European banks, the net interest margin of Chinese banks is generally higher than that of European banks. Deutsche Bank net interest margin is very low, only 0.68% in 2014.Also, Crédit Agricole is 0.71% in 2018. The reason for the higher net interest margin of Chinese banks is that the net interest margin has a strong positive correlation with the benchmark interest rate. The benchmark interest rate is adjusted by the central bank based on macroeconomic performance. Specifically, in the economic downturn cycle, the central bank will implement loose monetary policies (to adjust the benchmark interest rate as follows) to promote investment and consumption in order to boost the economy; while in the economic upward cycle, the central bank will implement a tightening monetary policy to suppress the overheating of the economy (Such as raising the benchmark interest rate) to prevent economic bubbles.

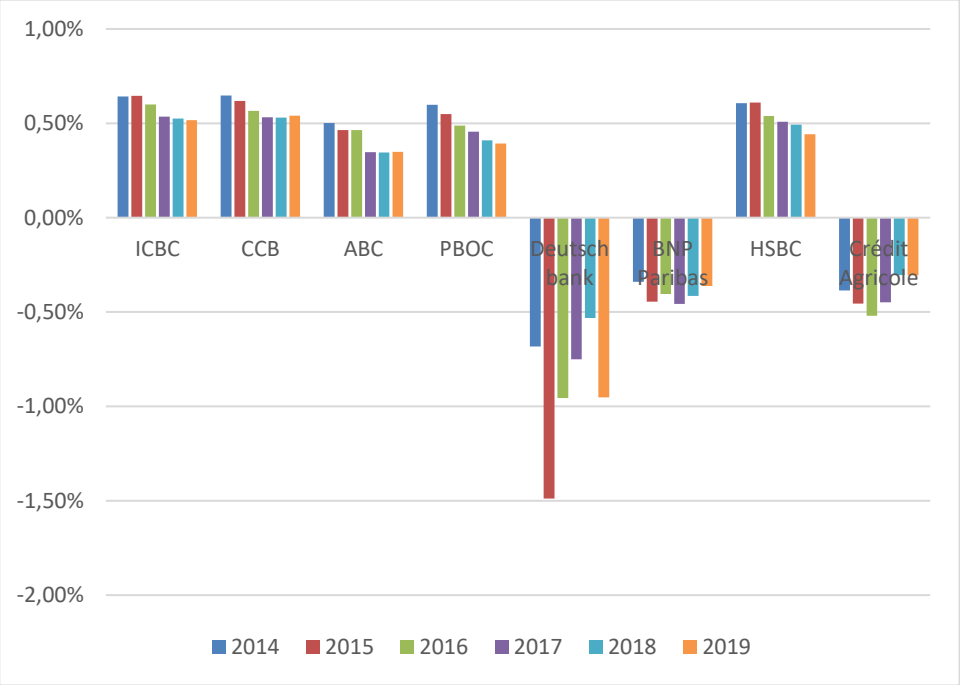
The change trend of the bank's net interest margin in 2019 may be manifested in four aspects: the sharp drop in the cost of interbank liabilities, the increase in the cost of deposits, the decline in investment yield, and the rise in loan yield. It is expected that the net interest margin of the entire banking industry will reach a relatively high point in the

first quarter of 2019. After the largest increase in the net interest margin in the first quarter, the stock banks will decline quarter by quarter. Point, and then it may be more stable in the low position. In China, the majority of banks 'income is still net interest income, which can generally account for 70% to 80% of the bank 's total income. Moreover, there are relatively few changes in the bank's net interest income, mainly two changes in the net interest margin and the size of interest-earning assets.

4.2.4 Net Non-interest Margin

Net non-interest margin is a financial measurement that revenue from non-interest items. This ratio is calculated by formula (3.5), the result see Figure 4.5.

Figure 4.5 Non-interest margin of selected bank （%）



From this figure, we can find a huge difference between Chinese banks and European banks. The net non-interest rate of Chinese banks has been declining year by year, but it remains at around 0.47%. The European banks' net non-interest rate of return is very low. Except for HSBC, the average net non-interest rate of return can be 0.5%, and other banks are negative. Deutsche Bank 's net non-interest rate is the lowest among all European banks. Even in 2015, it was only -1.49%, because the index has increased in the following years. At its peak in 2018, its net non-interest rate of return was -0.53%.

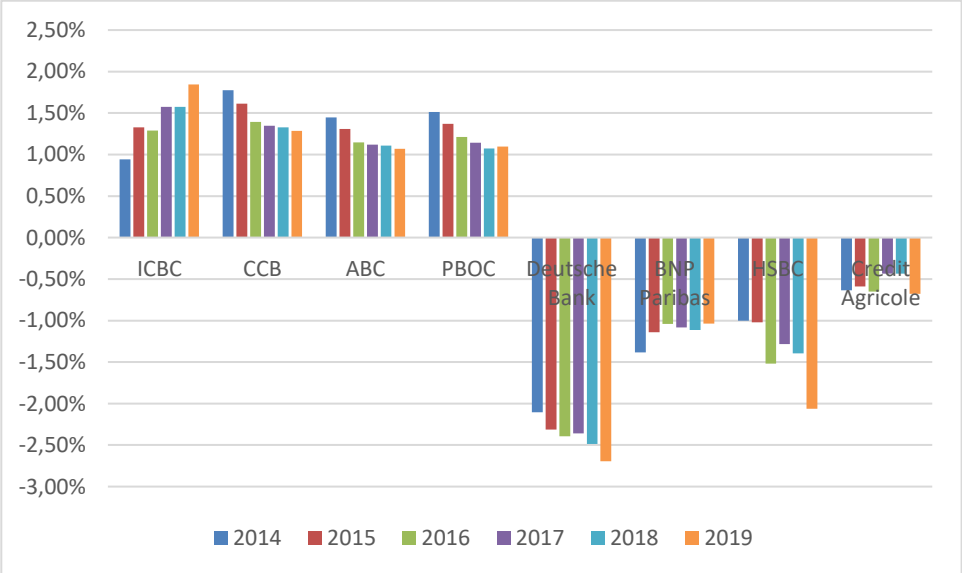
We can see that both Chinese banks and European banks. The development of non-interest net income business by commercial banks can improve profitability. Therefore, in the future operation and development, commercial banks should increase

the development of non-interest net income business, gradually increase their proportion in operating income, and fully understand non-interest income. The relative cost advantage of net interest income business. When formulating and adjusting the development strategy of commercial banks in the future, we must fully consider the development of non-interest net income business and give them corresponding support, while increasing the scale and proportion of non-interest net income business and reducing the relative cost of their business. Give full play to the advantages. However, while promoting the development of non-interest net income business, major commercial banks should weigh the benefits and risks according to their own comprehensive strength and strengthen cost control.

4.2.5 Net Operating Margin of Selected Banks

Net operating profit margin is a profit ratio after deducting other expenses. It measures the fairy tale's sales profit after paying variable production costs (such as workers' wages and raw materials) before paying interest or taxes. It is calculated by formula (3.6), the result we can see Figure 4.6.

Figure 4.6 Net operating margin of selected bank （%）



From this figure, we can see that the net operating margin of China's banking industry from 2014 to 2019 is generally higher than that of European banks. ICBC has the highest profit margin in 2019 at 1.85%. This is due to a 13.2% year-on-year increase in net profit. Chinese banks generally have much higher operating profits. For example, in 2019, ICBC's net operating profit will be 555,884 yuan, and CCB's net operating profit will be 326,954 yuan. From the perspective of income structure, the bank's operating income mainly includes net interest income, net fee and commission income and

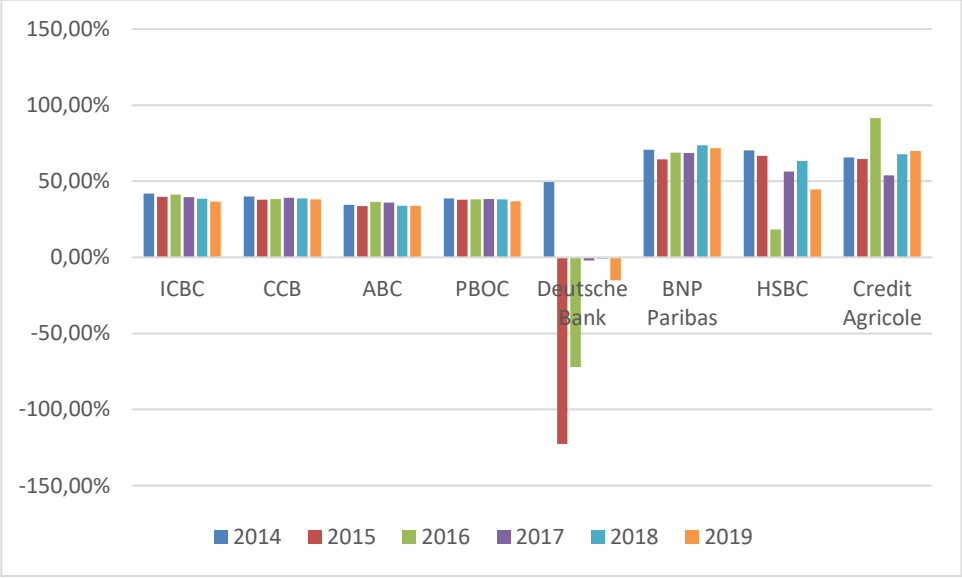
investment income, etc., while net interest income still occupies the main position. In the case of supervision and guidance to lower the interest rate of corporate loans, relying on the traditional "interest spread" model to achieve profitability has become unsustainable. Banks actively adjust their income structure and increase intermediate business income to increase profits.

But on the contrary, we can see that during this period, the profit margins of banks from the European Union are generally negative, except for Credit Agricole and HSBC, they maintain stable net profits. Deutsche Bank has suffered a net loss since 2014. Its negative profit margin is -2.1%, and its net operating profit was lost by 47,799 US dollars. It is mainly driven by weaknesses in specific business areas, and these weaknesses were exposed by extreme circumstances this year. Credit Agricole's net operating margins for both 2017 and 2018 were -0.44%.

4.2.6 Net Profit Margin of Selected Banks

Net profit margin is an important indicator that reflects the company's profitability. It refers to the profit margin after deducting all costs, expenses and corporate income tax. It can be calculate by formula (3.7), the result see Figure 4.7.

Figure 4.7 Net profit margin of selected bank （%）



It can be seen from the above chart that the net profit margin of the European banking industry is sometimes much larger than that of China, and sometimes the two are the same. Although China's banking industry is facing many challenges such as macroeconomic pressures and the continued advancement of market interest rate reforms, the profitability of listed banks is still not to be underestimated. Industrial and

Commercial Bank of China achieved a net profit of 312.224 billion yuan attributable to shareholders of the parent company in 2019, which still occupies the dominant position. Second is the Construction Bank, which made a net profit of 266.733 billion yuan last year, a year-on-year increase of 4.74%. The net profit of the mother bank of Agricultural Bank of China and Bank of China were 212.098 billion yuan and 187.405 billion yuan respectively.

The data shows that the European banking industry's net profit margin is unstable and volatile. In particular, Deutsche Bank ’s net profit margin in 2015 was only -122.67%, but in 2018 it was -0.76%. BNP Paribas is the most stable, with a net profit margin of -69% in recent years.

Overall, the bank will optimize asset and liability structure, business structure, and customer structure through refined management in the future, and at the same time, by strengthening pricing management capabilities and interest rate risk control capabilities, it is confident that it will do its best to maintain stable growth of China's banking business.

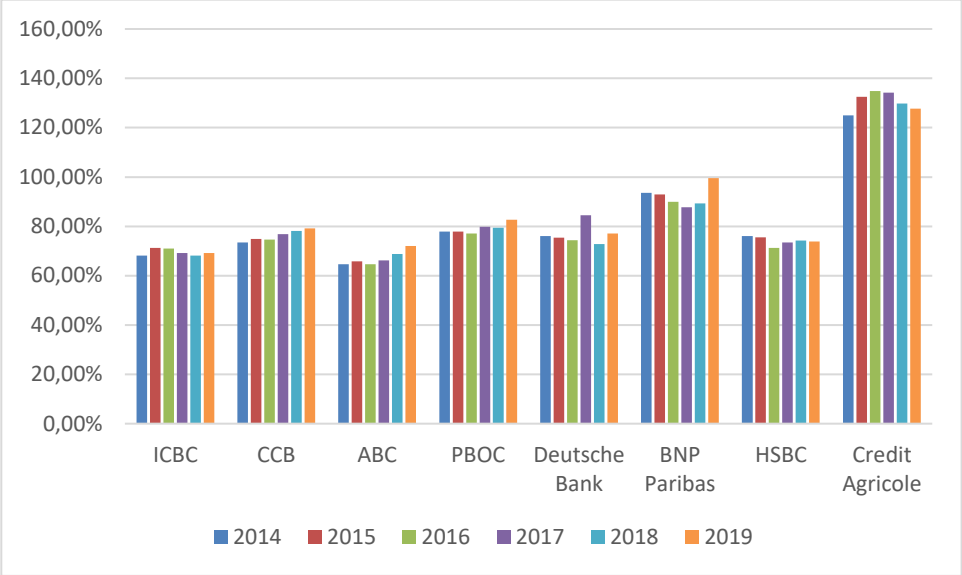
4.3 Liquidity Ratios

Liquidity ratios are the ratios that measure the ability of a company to meet its short term debt obligations. These ratios measure the ability of a company to pay off its short-term liabilities when they fall due.

4.3.1 Loan to Deposit Ratio of Selected Banks

The loan to deposit ratio is used to calculate a lending institution's ability to cover withdrawals made by its customers. A lending institution that accepts deposits must have a certain measure of liquidity to maintain its normal daily operations. It is better not to have this ratio too high for banks, because it means that banks might not have enough liquidity to cover any unforeseen requirements. We can calculate by formula (3.8), the result see Figure 4.8.

Figure 4.8 Loan to deposit ratio of selected bank （%）



From this figure, we can see that the loan-to-deposit ratio of these banks in China is less than 80%. Previously, Chinese regulations required that each bank must have a loan-to-deposit ratio of less than or equal to 75% to enhance liquidity risk management capabilities and Improve the asset and liability structure of every Chinese bank, but this rule has been repealed since 2015. With the passage of time, the 75% ceiling of the loan-to-deposit ratio has become increasingly unsuitable for economic and financial development. The cancellation of the loan-to-deposit ratio supervision index will help improve the lending capacity of China's banking industry. However, in the face of the current diversification of funding sources and asset forms in the banking industry, how to strengthen liquidity risk management in the future will be a major challenge.

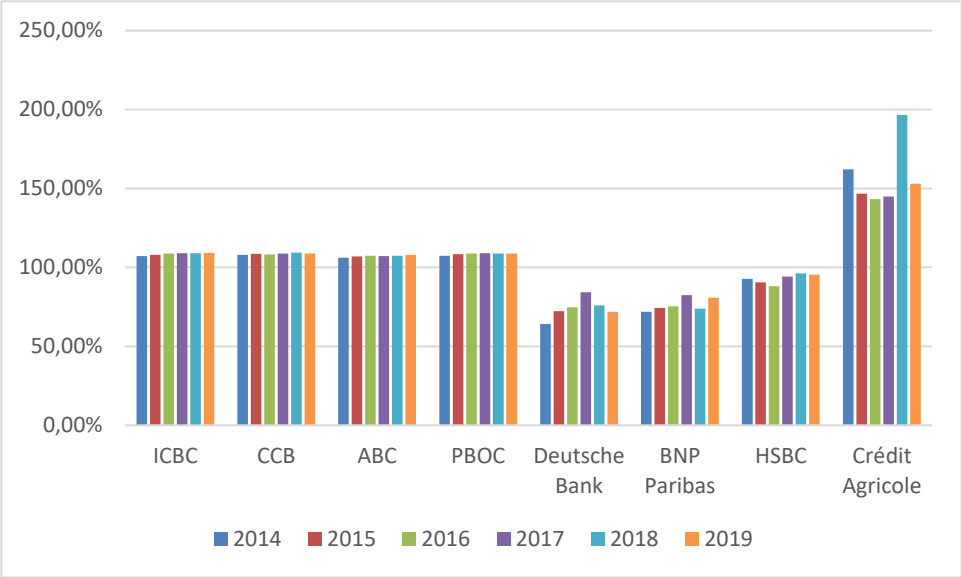
At the same time, we can see that from 2014 to 2019, European Union banks generally showed a downward trend, which is a data that proves that European banks maintain good liquidity. But BNP Paribas' loan-to-deposit ratio increased in 2019, rising 99.5%. Credit Agricole is facing a major financing problem: the loan-to-deposit ratio is terrible, with an average of up to 131%, and 12% of the capital needs to be solved by European Central Bank loans.

HSBC still maintains high liquidity in 2019, with a loan-to-deposit ratio of 73.82%. Because customers and bank deposits have experienced strong deposit growth, especially in Hong Kong, the United Kingdom and Europe. This also tells us that we must learn to focus on generating a high level of stable funds from customers, so that customer deposits will exceed customer loans, and banks can make better profits.

4.3.2 Current Ratio of Selected Banks

The current ratio reflects a company's ability to generate enough cash to pay off all its debts once they become due. It's used globally as a way to measure the overall financial health of a company. We can calculate by formula (3.9), the result see Figure 4.9.

Figure 4.9 Current ratio of selected banks



From this figure, we can see From this figure, we can see that the current ratio of Chinese banks is much more stable than European banks. Basically, the current ratios of the four largest banks in China are around 1.06-1.09. In 2019, ICBC ’s current ratio is the highest at 109.25%. Among them, his current assets were RMB 27,699,540 and current liabilities were RMB 25,354,657. Agricultural Bank's current ratio in 2014 was very low, only 106.16%.

In addition, we can see that the current ratios of the four European banks have changed significantly. Among them, Crédit Agricole is a bank with a relatively high current ratio, generally above 1.4. Especially in 2014, its current ratio was as high as 162.16%. BNP Paribas has been kept within a certain level, with a current ratio of 80.89% in 2019.

In general, the higher the current ratio, the stronger the short-term solvency of the enterprise and the more guaranteed the creditor's rights and interests. It also shows that the company has more working capital, which can be used to pay off debts, and shows

that the amount of assets that the company can perform is large, and the risk of loss suffered by creditors is small.

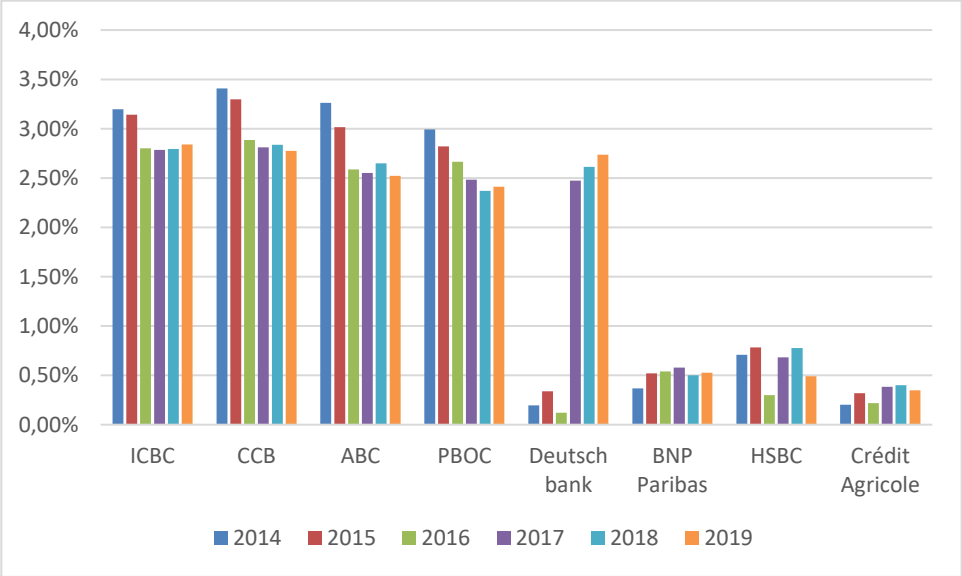
4.4 Activity Ratios

Activity ratios are a category of financial ratios that measure a firm's ability to convert different accounts within its balance sheets into cash or sales. They may be utilized to compare two different businesses within the same sector, or they may be used to monitor a single company's fiscal health over time.

4.4.1 Asset Turnover of Selected Banks

The asset turnover ratio can be used as an indicator of the efficiency with which a company is using its assets to generate revenue. We can calculate by formula (3.12), the result see Figure 4.10.

Figure 4.10 Asset turnover of selected bank （%）



As can be seen from this chart, the asset turnover ratio of European banks is lower than that of Chinese banks. The asset turnover ratio of Chinese banks is generally maintained at 2.9%, while the asset turnover ratio of European banks is only about 0.5%.

Generally speaking, the factors that affect the asset turnover rate mainly include:

- the industry in which the company is located and its operating background ,
- the length of the business cycle of the enterprise ,

- the asset composition and quality of the enterprise ,
- the management strength of the asset ,
- Financial policies adopted by the enterprise.

Since 2014, China's market economy has been booming, and banking business has received support from the national government, so the bank's asset turnover rate is not too high. In 2018, CCB's total assets are 23,222,693 million RMB, operating revenue are 658,891 million RMB. CCB's operating income increased a lot this year.

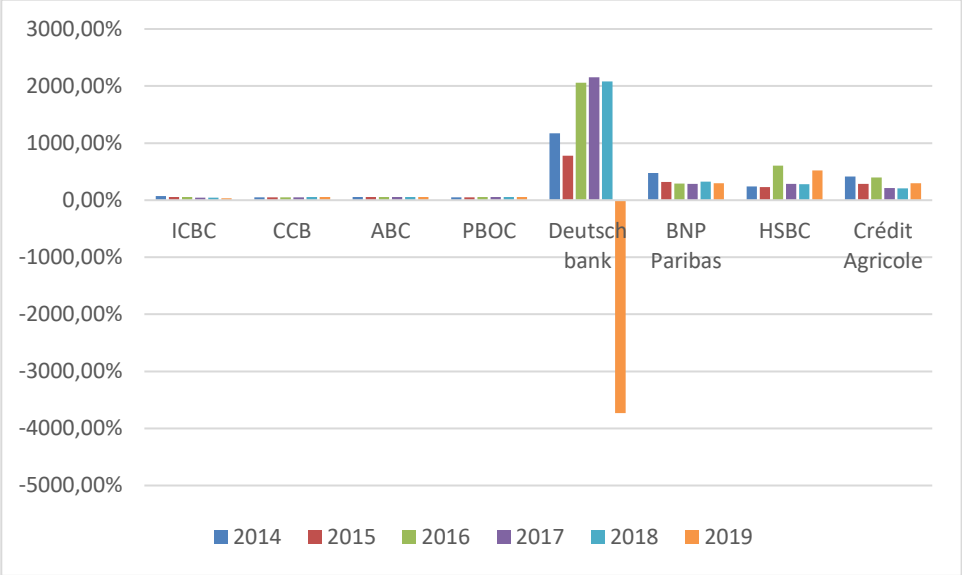
In addition, we can see banks in the European Union; Deutsche Bank and BNP Paribas maintained steady growth and fluctuated between 2014 and 2019. Deutsche Bank ’s asset turnover ratio suddenly increased in 2017 and became 2.74% in 2019. This was mainly due to the strong increase in assets and liabilities resulting in an increase in net interest income, as well as income related to other bank charges, and a substantial increase in new and renewed home insurance premium income.

In general, a low turnover rate only indicates that the enterprise's asset use efficiency is low, but the capacity does not necessarily mean a low profit. It is only that when the enterprise factors remain unchanged, increasing the turnover rate can increase profits.

4.4.2 Operating Efficiency Ratio of Selected Banks

The operating ratio shows how efficient a company's management is at keeping costs low while generating revenue or sales. We can use formula (3.13), the result see Figure 4.11.(%)

Figure 4.11 Operating efficiency ratio of selected bank （%）



From this figure, it can be seen that the operating efficiency of Chinese banks from 2014 to 2019 is particularly low, which is very different from that of EU banks. In theory, the operational efficiency of the bank ultimately depends on the cost management efforts of the managers at all levels and the operating environment. Both affect the operational efficiency of the current period and also translate into the organization's input-output capability. To a large extent determines the operational efficiency of the subsequent period. In recent years, operational efficiency is directly affected by the following factors:

- The scale of business has an impact,
- Impact of business model,
- Impact of life cycle,
- Impact of principal-agent relationship,
- Impact of operating environment.

Among these Chinese banks, ICBC showed a downward trend from 2014 to 2019, mainly due to changes in business models. From the perspective of business structure, since the risk cost of financial assets is now in the loss of impairment of financial assets other than operating income, the risk factors in net interest income have not been deducted, and operating income has declined. ICBC's operating efficiency ratio in 2014 was relatively high, at 70.51%. In 2014, operating expenses are 299,280 million RMB, operating revenues are 658,892 million RMB. ABC's operating efficiency ratio in 2018 is relatively high, at 58.52%. In 2018, operating expenses are 34,837,200 million RMB, operating revenues are 59,858,800 million RMB.

We can also see that Deutsche Bank ’s operating efficiency and profit margin was

the highest in 2016, reaching 145.86%. Its operating expenses clearly exceeded operating income by a large margin. In fact, its operating expenses did not change much compared with the same period in previous years, but its The operating income has been significantly reduced several times. The operational efficiency of Deutsche Bank in 2019 is particularly strange, is -37. Because of this year, its operating income is -1, 067 million US dollars.

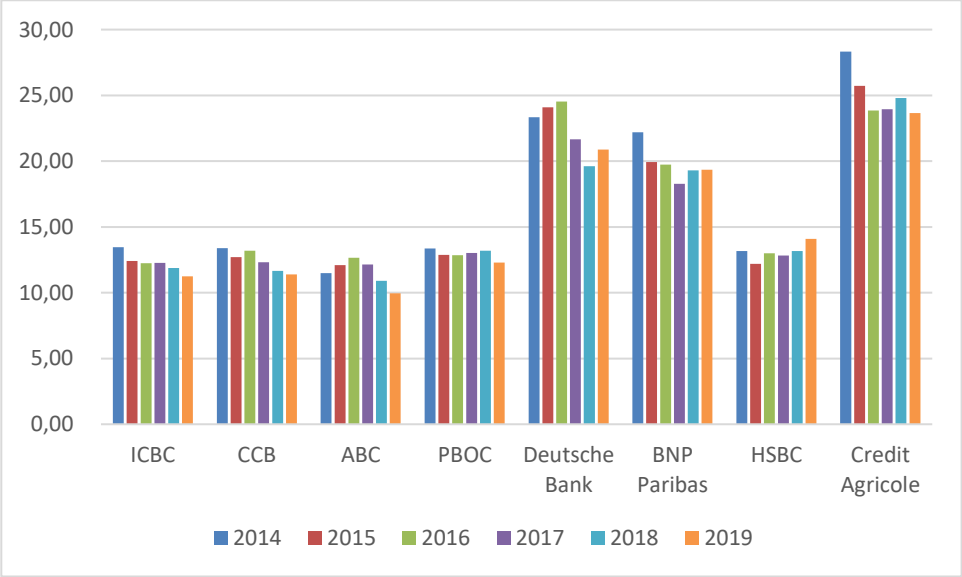
4.5 Financial Leverage Ratios

The ratios measure the ability of the business to meet its long-term debt obligations, such as interest payments on debt, the final principal payment on the debt, and any other fixed obligations like lease payments.These ratios compare the overall debt load of a company to its assets or equity, showing how much of the company assets below to shareholders vs. creditors.

4.5.1 Equity Multiplier of Selected Banks

The equity multiplier is a financial leverage ratio that measures the portion of company's assets that are financed by stockholder's equity. We can compute by formula (3.16), the result see Figure 4.12.

Figure 4.12 Equity multiplier of selected bank



From this figure, it can be seen that the difference between Chinese banks and European banks is not as large as the previous indicators. The equity multiplier of Chinese

banks is slightly lower than that of European banks. The average equity multiplier is about 13, which means Keeping Chinese banks maintain a low equity multiplier. This also means that Chinese banks do not need to worry about too much of their loans or debt burdens, and they are supported by the government, so the government will provide them with more financial assistance, through this financial support to help Chinese banks in trouble Time to reduce financial risk.

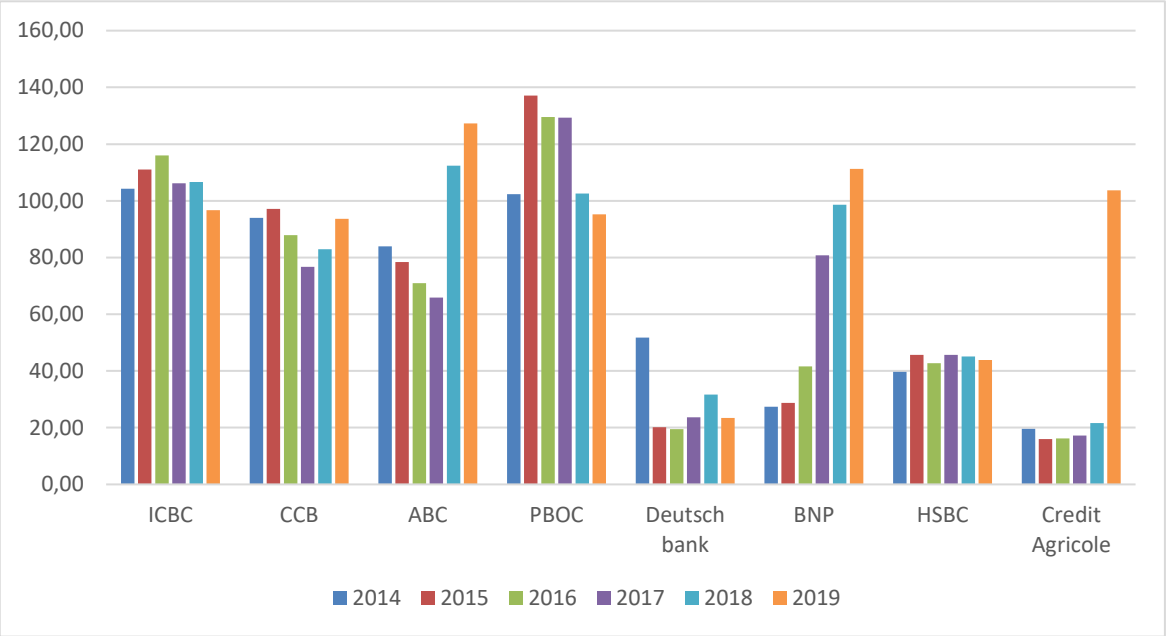
We can see that Deutsche Bank, BNP Paribas and Credit Agricole have higher equity multipliers from 2014 to 2019. Several banks have equity multipliers above 20. In general, it is because the economic situation in Europe has improved in recent years, customer loans have decreased, but shareholder equity has increased, especially the highest equity multiplier of Credit Agricole is 28.32. HSBC is similar to China's bank equity multiplier, with only 14.09 in 2019.

The equity multiplier reflects the "leverage" effect of bank capital and is therefore also called financial leverage. Generally speaking, the higher the equity multiplier, the higher the bank's capital profit margin. It can be seen that the European bank's profit margin is higher.

4.5.2 Risk Index of Selected Banks

Risk index is used to determine whether a company's asset and liability management is successful, and the risk index is based on the return on assets. We can calculate by formula (3.17), the result see Figure 4.13.

Figure 4.13 Risk index of selected bank



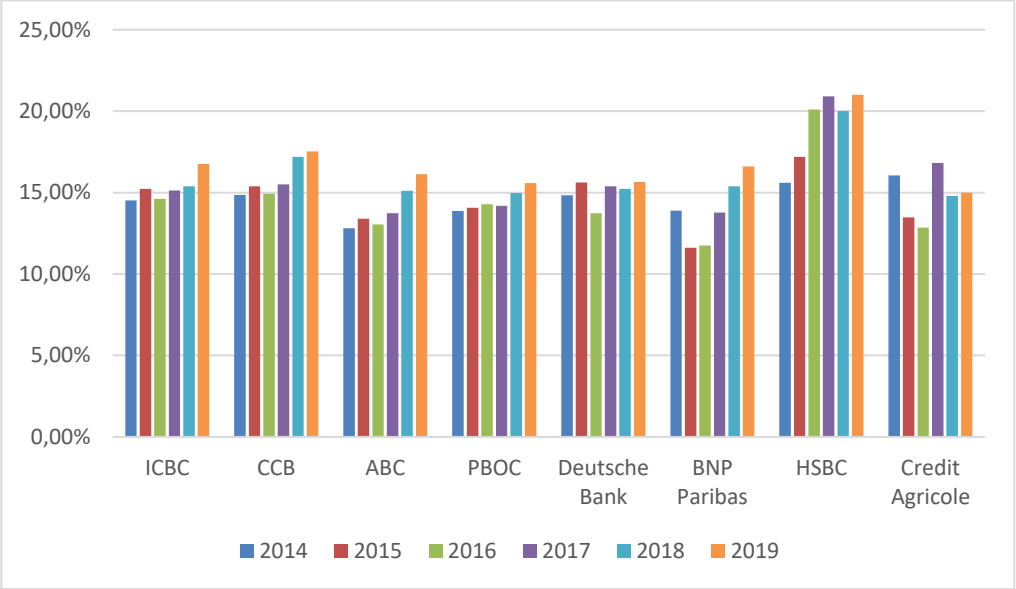
From this figure, it can be seen that the risk index of Chinese banks is generally higher than that of European banks, and from 2014 to 2019, Chinese banks have maintained a relatively stable level, with a risk index of about 100. Deutsche Bank 's highest risk index reached 51.76 in 2014, mainly due to its good return on assets, which resulted in its expected return on assets being higher than other European banks. Therefore, Deutsche Bank has developed well in the past two years. In its latest asset report, ABC Credit Bank won the title of the most anticipated bank for its super high total assets.

The average risk indexes of BNP Paribas and HSBC are 80 and 45 respectively, mainly because of their negative asset returns in the past. Deutsche Bank and Credit Agricole will maintain a risk index of returns because of their recent changes in asset returns. The risk index of Chinese banks basically declined year by year, because the central bank implemented a stable monetary policy in 2017, the benchmark interest rate for deposits and loans remained stable, and the interbank market interest rate was controlled at 1%. A reasonable level provides a stable policy environment for banks' net interest margin. The rate of return continues to increase and develop steadily. However, ABC 's risk index is higher than other Chinese banks, because its asset return rate has not exceeded that of other Chinese banks in the past, resulting in an lower in expected asset return rate, and therefore a higher risk index.

4.5.3 Capital Adequacy Ratio of Selected Banks

The capital adequacy ratio refers to the ratio of the bank 's own capital to the weighted risk assets and represents the bank 's final solvency for liabilities. It can be computed by formula (3.22), the result see Figure 4.14.

Figure 4.14 CAR of selected bank



We can see from the chart that whether it is a Chinese bank or a European bank, from 2014 to 2019, the capital adequacy ratio of all banks is slowly increasing, and the difference between Chinese and European banks is not much different. At present, due to the overall stability of China's economic situation and the stable and healthy operation of the financial system, various risks are generally controllable. Therefore, the capital adequacy ratio of China's commercial banks reached 14.12%, an increase of 0.58 percentage points over the same period last year. Moreover, the construction bank's capital adequacy ratio reached a new high in 2019, with 17.52%

Looking back at European capital adequacy ratios. As of the end of 2018, HSBC's capital adequacy ratio fell from 20.9% in the previous year to 20.0%. Historically, the bank's capital ratio reached a record high of 20.9% in 2017 and reached a record low of 11.4% in 2008. As of the end of 2018, the capital adequacy ratio reached 17.0%, down from 17.3% in the same period last year. However, the capital adequacy ratio of BNP Paribas Bank in 2015 was not high, only 11.61%.

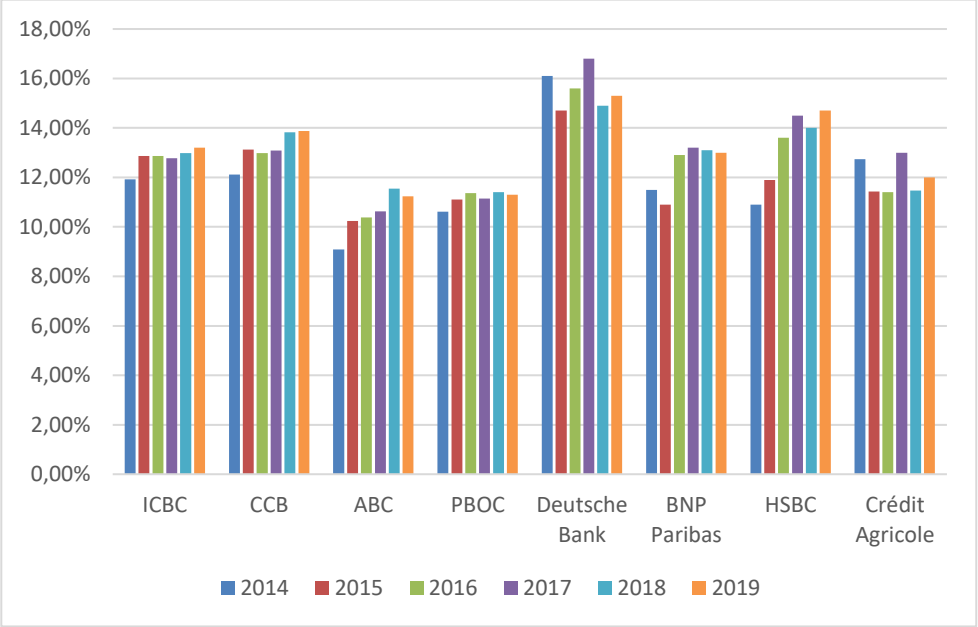
But the capital adequacy ratio is not as low as possible. Some regulations clearly stipulate that if the capital adequacy ratio of a commercial bank is less than 8%, or the

core capital adequacy ratio is less than 4%, the CBRC will initiate a "timely correction measure (PCA)" to compulsorily correct the assets of commercial banks.

4.5.4 Core Capital Adequacy Ratio of Selected Banks

Tier 1 capital is essentially the amount of money a bank has on hand in case it needs to cover unexpected expenses from risky transactions. Core capital is mostly the combination of retained earnings and common stock. And we can computed by formula (3.24), the result see Figure 4.15.

Figure 4.15 Core tier 1 ratio of selected bank



From this figure, it can be seen that China's core capital adequacy ratio has an upward trend from 2014 to 2019, and the core capital adequacy ratios of CEIBS banks are not much different, about 13%. According to regulatory requirements, by the end of 2019, in accordance with Basel III, the core Tier 1 capital adequacy ratio, Tier 1 capital adequacy ratio and capital adequacy ratio of systemically important banks shall reach 8.5%, 9.5% and 11.5%, respectively. Systemically important banks should reach 7.5%, 8.5% and 10.5% respectively. Among European banks, Deutsche Bank has maintained a high core capital adequacy ratio. There were 16.1% in 2014 and 15.3% in 2019.

Looking at China's five state-owned banks, after a fixed increase of 100 billion yuan, the capital situation of the Agricultural Bank of China has improved significantly and has returned to the midstream level from the bottom of last year. The capital adequacy ratio of China Construction Bank rebounded slightly, while the core tier one capital

adequacy ratio decreased slightly. However, by 2019, CCB's core adequacy ratio will rise to 13.88% again. However, compared with the end of last year, ICBC, Bank of China and Bank of Communications have all experienced a decline in the core tier 1 capital adequacy ratio. This shows that China must continue to implement a sound monetary policy to maintain a reasonable and sufficient liquidity and a reasonable increase in the scale of social financing. Implement proactive fiscal policies, better integrate fiscal policies with monetary and financial policies, and ensure the core capital adequacy ratio of banks.

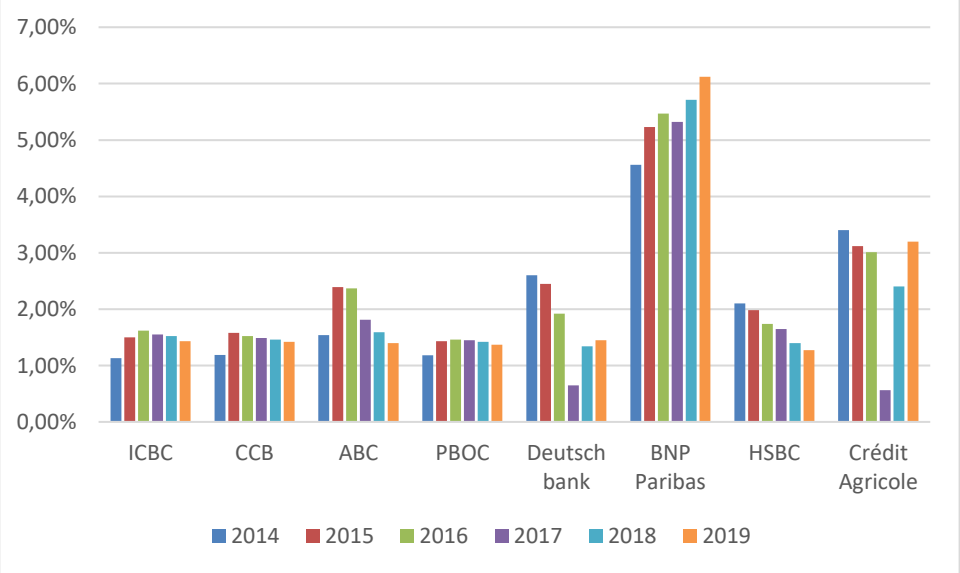
4. 6 Asset Quality Ratios

Asset quality ratio is an assessment of the credit risk associated with specific assets. These assets may be substandard, suspicious, or loss loans. This asset usually requires interest payments, such as loans and portfolios. It can measure the effectiveness of management in controlling and monitoring credit risk, and can also judge the degree of risk of bank assets.

4.6.1 Non-performing Loans Ratio of Selected Banks

Non-performing loan ratio refers to the financial institution non-performing loans account of financial institutions. It is one of the important indicators to evaluate the security status of financial institutions' credit assets. We can calculate it by formula (3.26), the result see Figure 4.16.

Figure 4.16 NPL ratio of selected bank



From this figure, it can be seen that from 2014 to 2019, the NPL ratio of Chinese banks is slightly lower than that of European banks. As of 2019, China's bank non-performing loan balance was 2.03 trillion yuan, a decrease of 6.8 billion yuan over the same period; commercial banks' non-performing loan ratio was 1.83%, a decrease of 0.04 percentage points over the same period. With the economy improving, the NPL ratio of the four major banks declined in 2019. Among them, the non-performing loan ratio of the Industrial and Commercial Bank of China decreased by 0.03 percentage points from the beginning of 2018 to 1.52%, which has declined for two consecutive years. The non-performing loan ratios of China Construction Bank and Bank of China both fell by 0.03 percentage points, to 1.46% and 1.42%, respectively. Agricultural Bank of China's non-performing rate was 1.59%, a decrease of 0.22 percentage points from the previous year.

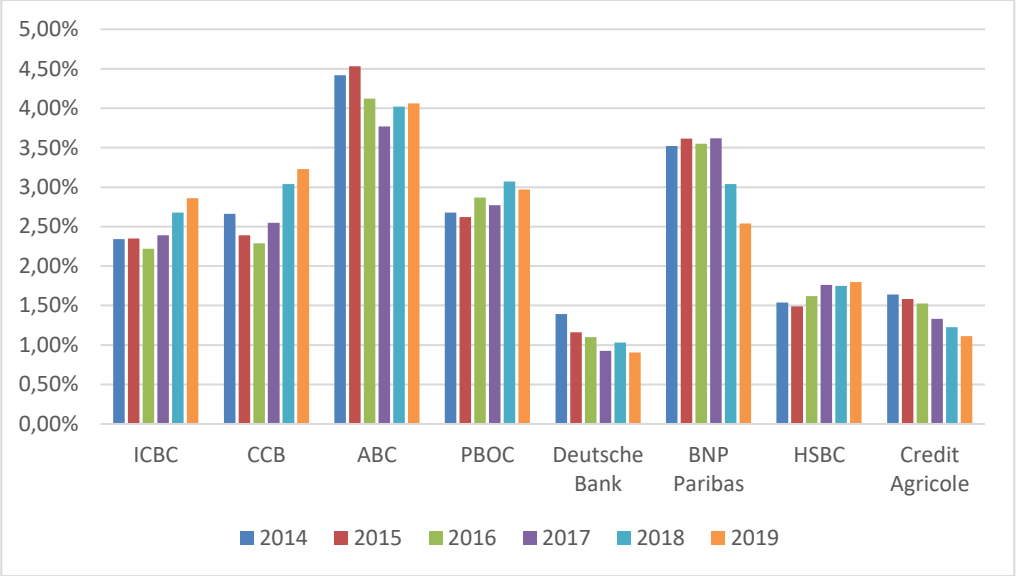
On the other hand, we can see that BNP Paribas' NPL ratio is relatively high among European banks. After a fine (6 billion euros) was recorded in 2014, BNP Paribas has reported considerable net profit in the past six years. Comparison with peers shows that competitors have been able to greatly improve their profitability in recent years. Based on the cost-to-income ratio, it is clear that BNP Paribas continues to save money by increasing the degree of digitization and automation. However, the increased profitability also led to an increase in risk-weighted assets. Peer comparison shows that the risk of assets is still there. For a French bank with such a large business volume, the non-performing loan ratio will continue to increase, which will be necessary for the positive development of the French economy.

In addition, we also found that the non-performing loans of HSBC Bank in 2017 decreased from 6.4% in 2016 to 5.3% of total loans. This led to a large reversal of the company's provision for impairment in the past.

4.6.2 Allowance to Total Loans Ratio of Selected Banks

Allowance to total loans ratio refers to the total amount of credit at a certain point in time, and all new loans of commercial banks thereafter pay a certain percentage of the reserve to the central bank. And we can calculate by formula (3.27), the result see Figure 4.17.

Figure 4.17 Allowance to total loans ratio of selected bank



From this figure, it can be seen that the allowance to total loan ratio of the Chinese banking industry maintained a continuous upward trend from 2014 to 2019. In 2019, the ICBC ratio is 2.86%, the CCB ratio is 3.23%, the Agricultural Bank ratio is 4.06%, and the PBOC ratio is 2.97%. In particular, in 2018, PBOC's loan impairment losses amounted to 107.905 billion yuan, a year-on-year increase of 23.88 billion yuan, an increase of 28.42%. By 2019, the Group's total impaired loans amounted to 167.952 billion yuan, an increase of 9.07 billion yuan from the end of the previous year, and the impaired loan rate was 1.42%, a decrease of 0.03 percentage points from the end of the previous year. Among them, the total amount of impaired loans of institutions in Mainland China was 627.778 billion yuan, an increase of 8.57 billion yuan from the end of the previous year, and the impaired loan rate was 1.76%, a decrease of 0.04 percentage points from the end of the previous year. The total value of impaired loans for institutions in Hong Kong, Macao, Taiwan and other countries and regions was 4.174 billion yuan, an increase of 500 million yuan over the end of the previous year, and the impaired loan ratio was 0.17%, an increase of 0.01 percentage points over the end of the previous year.

Deutsche Bank, HSBC, and Credit Agricole have remained between 0.9% and 1.7% from 2014 to 2019. Although the ratio of provision to total loans is low, they are vaguely showing a downward trend. BNP Paribas has shown a high allowance to total loan ratio in the past six years. In 2017, the ratio reached the highest 3.62%. This was due to the better economic environment at the time and the relatively loose government management. As a result, the quality of mortgage credit was relatively good, so that the loan loss reserves of international banks increased significantly.

4. 7 Summary

We have selected eight banks for comparison in this chapter. First, we selected the four largest banks from China and the EU. Then, by applying some of the indicators selected in the previous chapter, a more comprehensive comparison of these banks has been made, and these indicators have been introduced in detail above. Obviously, we will use brief and clear words to describe the general situation of Chinese and European banks under each indicator. After macro-comparing Chinese banks and European banks, we will elaborate on the data results of the specific selected banks. Each ratio used for comparison.

For example, we use the profit rate indicator to assess the profitability of each bank. From the digital chart, we can clearly find that the ROA and ROE of the selected Bank of China are larger than those of European banks. Generally speaking, the profitability of Chinese banks has similar data and the trend of increase and decrease. Under normal circumstances, the average ROA of selected Bank of China reached 1.2%, and the average ROE was also 15.3%. But in fact, the ROE of China's banking industry is at an upper middle level in all industries, but ROA is at a low level. In 2014, net profit growth fell to single digits, and in 2017, asset scale also entered single digit growth. However, the ROA and ROE of European banks are at a low level, because many banks do not particularly effectively control daily operating costs, causing a large amount of cost losses to their banks between 2014 and 2019, and the European economic market The deterioration of conditions has hit the development of the banking industry to some extent. Therefore, we can see from the comparison of various indicators of profitability that, compared with European Union banks, Chinese banks have always maintained a relatively stable profit level. But in addition to this, HSBC Bank among European banks has maintained a stable and rising trend, with average ROA and ROE of 0.42% and 5%, respectively. From the data point of view, the profitability of HSBC is particularly prominent among European banks.

From the current ratio, the deposit-loan ratio is a representative indicator. Chinese banks and European banks are not much different in this respect, but it can be seen that the deposit-loan ratio of Chinese banks is basically below 80%, while many European banks' loan-to-deposit ratio will exceed 100%. From the perspective of bank profitability, the higher the loan-to-deposit ratio, the better, because deposits are interest-bearing, the so-called cost of funds. If a bank has a lot of deposits and few loans, it means that it has high costs and little income. , The profitability of banks is poor. From this perspective, the high ratio of bank deposits to loans in Europe makes sense. However, from the perspective of the bank's risk resistance, the deposit-loan ratio should not be too high,

because the bank also has to deal with the daily cash withdrawal and daily settlement of the majority of customers. If the deposit-loan ratio is too high, this part of the funds will be insufficient, which will Payment crisis. Therefore, from this perspective, the low deposit-loan ratio of Chinese banks makes sense.

On the other side, we see that the equity multiplier of the selected Bank of China is lower than that of the European bank. It can be seen from the data that the equity multiplier of Chinese banks has been in a relatively stable range, basically between 10-14, while the average European bank has reached 22. This comparison implies that compared with the banks selected by the European Union, China's selected banks will have a lower debt level, and China's bank equity will be higher. In contrast, European banks, especially Deutsche Bank and Credit Agricole, have the highest equity multipliers, and their indicators are all above 20. However, from 2014 to 2019, their equity multipliers also declined significantly. In 2019, Deutsche Bank declined to 20.88. This shows that these banks no longer rely solely on borrowing as a source of funds, but seek more equity interests.

From the perspective of non-performing loans and risk indexes, the non-performing loan ratio of selected banks in China is below 2%. At the end of 2018, the NPL ratio of China's banking industry reached 1.83%, an increase of 0.09 percentage points from the end of the previous year. This was after the banks had written off 988 billion yuan of non-performing loans (more than 259 billion yuan from the previous year). It can be seen from this that the credit quality of the Chinese-funded banking industry is basically stable, and verification efforts have increased. However, it can be seen that the four selected Chinese banks benefited from the steady increase in their asset return. Over the past six years, Chinese banks have high asset returns and steady growth, resulting in higher expected asset returns, but the average risk index of Chinese banks is 87. Compared with the risk index of European banks, the ratio of Chinese banks is higher. A similar situation occurred in selected EU banks. The average risk index of Deutsche Bank, BNP Paribas and HSBC is around 45, mainly because their past return on assets has been negative, and the volatility of these banks 'expected return on assets has been on a downward trend, and they may all increase their bankruptcy. Possible. But it can still be seen that China's bank risk index is higher.

In general, the selected Chinese banks maintain consistency in many indicators and data. These banks are not very different. They are all profitable and have reliable and quality assets. Chinese banks are basically supported by the government, and they are good at controlling costs and expenditures. And the bank's final debt solvency is stronger, which means that the capital adequacy ratio is higher. In contrast, European banks have

a more relaxed and free economic environment, so the capital adequacy ratio of European banks will be slightly higher than that of Chinese banks. With reference to the Basel III regulatory framework, a comprehensive assessment of the capital adequacy ratio, leverage ratio and liquidity ratio of the EU banking industry is conducted. Overall, as of 2019, the level of capital adequacy of European banks has improved, with an average Tier 1 capital adequacy ratio of 13%. We can find that the selected EU banks also have a very high level of debt service.

5 Conclusions

As banks face pressure from falling interest margins, difficulty in raising non-interest income, and insufficient capital replenishment. Both the Chinese banking industry and the European banking industry are in a more severe global competition environment, which is a challenge for banks as well as opportunities. Under various difficulties, how to improve their profitability and obtain more benefits at the minimum cost Improving the asset structure and quality of banks, occupying more market shares, and reducing operational risks are important issues that banks should think about now.

The aim of this bachelor thesis was comparison of selected banks efficiency in China and the Europe from 2014 to 2019.And we use different financial ratios to calculate the performance of each bank over the years, and then compare Chinese banks with European banks.

Obviously, we divided this article into five chapters. In the first chapter, we briefly introduced the general content of the paper, and clarified the purpose and significance of our writing. In the second chapter , we introduced the basic definition of the banking industry, as well as the functions and types of banks. Of course, we also introduced the banking industry of China and the European Union in terms of macroeconomic information, history, structure and regulatory supervision, and compared the differences between Bank of China and European banks. China's current financial system is a system of financial institutions led by the People's Bank of China, with state-owned wholly-owned commercial banks as the main body, national policy banks and other commercial banks, and multiple financial institutions coexisting and cooperating with each other. The regulation of European banks is based on market regulation, usually composed of universal banks and wholesale banks. In the third chapter, we focused on the methods of different financial ratios, which can be roughly divided into six types.

Looking at the fourth chapter, we selected the four largest banks from China and Europe based on the total assets of each bank, and explained the calculation of each bank under different economic indicators from 2014 to 2019. From the perspective of profitability, we know that China's selected banks have higher interest rates than those selected by the European Union, with an average ROE of 14.64%. This is because China's economic development has been improving for a long time, and monetary and fiscal policies accurately support the recovery of the real economy, which helps to maintain the stability of the domestic financial industry and banking industry, and thus the profitability of Chinese banks is better. As we all know, the European banking industry is facing an unfavorable external economic situation and interest rate environment, and its operations

and development are facing complex situations. There are many reasons for the weak development of the European banking industry from 2014 to 2019. To put it simply, we could attribute it to the weak economic growth of the euro zone. In addition, the problem of European refugees is highlighted, and terrorist attacks often affect the economic environment. Therefore, in recent years, the risk index is high, but the profitability is low, and the capital adequacy ratio is not optimistic. The average net interest margin of these four European banks is only 1.02%. In summary, Chinese banks have performed better.

In addition, the chapter 4 compared economic indicators such as loan-to-deposit ratio, current ratio, asset turnover ratio, operating efficiency ratio, equity multiplier, capital adequacy ratio and non-performing loan ratio. During this period, it is worth noting the capital adequacy ratio. Overall, the capital adequacy ratio of large Chinese banks is good, stable at around 14.6%. However, in the long run, there are still hidden dangers in China's bank capital adequacy ratio. Banks' management of capital funds is mainly limited to core capital, and the management of subsidiary capital has not received enough attention. Similarly, it is not difficult to find that the banks selected by the European Union and the banks selected by China have similar capital adequacy ratios, probably around 15%, and HSBC may sometimes be higher than 20%. However, the average capital adequacy ratio of European banks because they pay more attention to Basel II and III, and their ability to withstand default risks is also large, and their capital risk is also small. In contrast, European banks are more resistant to capital risks than Chinese banks.

Of course, there are many indicators in the fourth chapter related to deposits and loans, so the loan-to-deposit ratio is also a good way to test the efficiency of banks. The bank deposit-loan ratio in China has been maintained at around 75%, while the bank deposit-loan ratio in Europe is sometimes higher than 130%. The payment crisis, such as the spread of the payment crisis, may lead to a financial crisis, which is extremely harmful to the regional or national economy. Therefore, in the face of the economic impact of this epidemic, Chinese banks have more sufficient reserves, which may solve the problem better than European banks.

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List of Abbreviations

ABC Agricultural Bank of China

CCB China Construction Bank

CBRC China Banking Regulatory Commission

CEBS Committee of European Banking Supervisor

ECB European Central Bank

EBA European Banking Authority

ESA European Supervisory Authority

EIOPA European Insurance and Occupational Pensions Authority

HSBC Hong Kong and Shang Hai Banking Corporation

ICBC Industrial and Commercial Bank

LTD Loan to deposit

NPL Nonperforming loans

PBOC People's Bank of China

ROA Return on assets

ROAA Return on average assets

ROE Return on equity

RI Risk index

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List of Annexes

Annexes

Annex 1 Financial ratios for selected banks from 2014 to 2019

ROA	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Credit Agricole
2014	1.34%	1.36%	1.12%	1.16%	0.10%	0.26%	0.50%	0.13%
2015	1.25%	1.25%	1.02%	1.07%	-0.42%	0.34%	0.52%	0.21%
2016	1.16%	1.11%	0.94%	1.01%	-0.09%	0.37%	0.05%	0.20%
2017	1.10%	1.10%	0.92%	0.95%	-0.05%	0.40%	0.38%	0.21%
2018	1.08%	1.10%	0.90%	0.90%	-0.02%	0.37%	0.49%	0.27%
2019	1.04%	1.06%	0.86%	0.89%	-0.42%	0.38%	0.22%	0.24%
ROE	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Credit Agricole
2014	18.05%	18.23%	12.90%	15.53%	2.27%	5.79%	6.56%	3.78%
2015	15.52%	15.84%	12.28%	13.75%	-10.05%	6.69%	6.36%	5.32%
2016	14.17%	14.62%	11.90%	13.04%	-2.16%	7.32%	0.71%	4.79%
2017	13.51%	13.57%	11.15%	12.37%	-1.10%	7.24%	4.93%	4.94%
2018	12.82%	12.84%	9.77%	11.93%	-0.39%	7.12%	6.49%	6.72%
2019	11.71%	12.05%	8.52%	10.90%	-8.67%	7.31%	3.10%	5.72%
net interest margin	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Crédit Agricole
2014	2.39%	2.61%	2.69%	2.11%	0.68%	0.92%	1.32%	0.72%
2015	2.29%	2.49%	2.45%	1.95%	0.95%	1.13%	1.35%	0.81%
2016	1.95%	1.99%	2.03%	1.69%	0.92%	1.08%	1.26%	0.87%
2017	2.00%	2.05%	2.10%	1.74%	0.80%	1.10%	1.12%	0.86%
2018	2.07%	2.09%	2.11%	1.69%	0.85%	0.95%	1.19%	0.71%
2019	2.02%	2.01%	1.96%	1.64%	0.97%	0.94%	1.12%	0.73%
net non-interest margin	ICBC	CCB	ABC	PBOC	Deutsch bank	BNP Paribas	HSBC	Crédit Agricole
2014	0.64%	0.65%	0.50%	0.60%	-0.68%	-0.34%	0.61%	-0.39%
2015	0.65%	0.62%	0.46%	0.55%	-1.49%	-0.44%	0.61%	-0.46%
2016	0.60%	0.57%	0.46%	0.49%	-0.96%	-0.40%	0.54%	-0.52%
2017	0.54%	0.53%	0.35%	0.46%	-0.75%	-0.46%	0.51%	-0.45%
2018	0.52%	0.53%	0.35%	0.41%	-0.53%	-0.41%	0.49%	-0.30%
2019	0.52%	0.54%	0.35%	0.39%	-0.95%	-0.36%	0.44%	-0.31%
net operating margin	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Credit Agricole
2014	0.94%	1.78%	1.45%	1.51%	-2.10%	-1.38%	-1.00%	-0.64%
2015	1.33%	1.61%	1.31%	1.37%	-2.31%	-1.14%	-1.02%	-0.59%
2016	1.29%	1.39%	1.15%	1.21%	-2.39%	-1.04%	-1.52%	-0.65%
2017	1.58%	1.35%	1.12%	1.14%	-2.36%	-1.08%	-1.28%	-0.44%
2018	1.57%	1.33%	1.11%	1.07%	-2.49%	-1.11%	-1.39%	-0.44%
2019	1.85%	1.29%	1.07%	1.10%	-2.81%	-1.03%	-2.06%	-0.68%
net profit margin	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Credit Agricole
2014	41.93%	40.01%	34.46%	38.83%	49.48%	70.77%	70.21%	65.60%
2015	39.81%	37.82%	33.72%	37.83%	-122.67%	64.49%	66.63%	64.69%
2016	41.29%	38.41%	36.37%	38.06%	-72.14%	68.71%	18.26%	91.60%
2017	39.57%	39.19%	35.96%	38.28%	-2.06%	68.60%	56.40%	53.89%
2018	38.61%	38.80%	33.85%	38.17%	-0.76%	73.73%	63.39%	67.74%
2019	36.64%	38.15%	33.94%	36.76%	-15.17%	71.73%	44.72%	69.77%
asset turnover	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Crédit Agricole
2014	3.20%	3.41%	3.26%	2.99%	0.20%	0.37%	0.71%	0.20%
2015	3.14%	3.30%	3.01%	2.82%	0.34%	0.52%	0.78%	0.32%
2016	2.80%	2.89%	2.59%	2.66%	0.12%	0.54%	0.30%	0.22%
2017	2.78%	2.81%	2.55%	2.48%	2.47%	0.58%	0.68%	0.38%
2018	2.79%	2.84%	2.65%	2.37%	2.61%	0.50%	0.78%	0.40%
2019	2.84%	2.77%	2.52%	2.41%	2.74%	0.53%	0.49%	0.35%
operating efficiency	ICBC	CCB	ABC	PBOC	Deutsch bank	BNP Paribas	HSBC	Crédit Agricole
2014	70.51%	47.89%	55.66%	49.40%	1170.29%	475.42%	241.43%	412.53%
2015	57.71%	51.08%	56.57%	51.43%	780.39%	319.32%	230.50%	283.79%
2016	53.95%	51.68%	55.62%	54.51%	2059.49%	292.92%	607.54%	396.54%
2017	43.44%	52.03%	56.18%	54.02%	2151.15%	287.94%	288.18%	213.77%
2018	43.70%	53.18%	58.20%	54.68%	2083.17%	322.66%	279.27%	209.13%
2019	35.00%	53.66%	57.55%	54.56%	-3728.21%	296.55%	519.50%	295.79%

Annexes

Annex 2 Financial ratios for selected banks from 2014 to 2019

Equity multiplier	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Credit Agricole
2014	13.46	13.38	11.48	13.37	23.34	22.19	13.17	28.32
2015	12.41	12.70	12.09	12.89	24.09	19.93	12.20	25.73
2016	12.25	13.19	12.65	12.86	24.54	19.74	13.01	23.84
2017	12.26	12.32	12.16	13.01	21.66	18.28	12.83	23.96
2018	11.89	11.66	10.90	13.19	19.61	19.30	13.17	24.79
2019	11.25	11.38	9.96	12.30	20.88	19.35	14.09	23.65
loans/deposit ratio	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Credit Agricole
2014	68.13%	73.45%	64.61%	77.93%	76.11%	93.63%	76.10%	125.01%
2015	71.29%	74.88%	65.81%	77.89%	75.44%	92.95%	75.51%	132.56%
2016	71.02%	74.59%	64.63%	77.08%	74.32%	89.96%	71.28%	134.83%
2017	69.19%	76.84%	66.20%	79.78%	84.45%	87.78%	73.44%	134.14%
2018	68.20%	78.12%	68.84%	79.41%	72.79%	89.26%	74.27%	129.80%
2019	69.19%	79.17%	72.05%	82.62%	77.11%	99.50%	73.82%	127.70%
current ratio	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Crédit Agricole
2014	107.25%	108.08%	106.16%	107.45%	64.26%	71.83%	92.80%	162.16%
2015	108.06%	108.55%	106.91%	108.41%	72.35%	74.32%	90.62%	146.76%
2016	108.82%	108.21%	107.31%	108.78%	74.65%	75.35%	88.09%	143.32%
2017	108.94%	108.83%	107.24%	108.93%	84.22%	82.40%	94.25%	144.84%
2018	108.94%	109.38%	107.28%	108.81%	76.00%	73.99%	96.20%	196.67%
2019	109.25%	108.71%	108.00%	108.83%	71.92%	80.89%	95.37%	153.04%
RI	ICBC	CCB	ABC	PBOC	Deutsch bank	BNP	HSBC	Credit Agricole
2014	104.27	93.94	83.92	102.32	51.76	27.39	39.71	19.56
2015	111.01	97.10	78.46	137.15	20.20	28.73	45.64	15.94
2016	115.95	87.91	70.92	129.57	19.45	41.62	42.79	16.16
2017	106.16	76.71	65.91	129.26	23.62	80.82	45.65	17.20
2018	106.58	82.87	112.42	102.60	31.72	98.56	45.10	21.61
2019	96.64	93.65	127.32	95.23	23.48	111.26	43.90	103.68
CAR	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Credit Agricole
2014	14.53%	14.86%	12.82%	13.87%	14.84%	13.89%	15.60%	16.05%
2015	15.22%	15.39%	13.40%	14.06%	15.62%	11.61%	17.20%	13.47%
2016	14.61%	14.94%	13.04%	14.28%	13.73%	11.76%	20.10%	12.85%
2017	15.14%	15.50%	13.74%	14.19%	15.38%	13.77%	20.90%	16.83%
2018	15.39%	17.19%	15.12%	14.97%	15.22%	15.38%	20.00%	14.80%
2019	16.77%	17.52%	16.13%	15.59%	15.67%	16.60%	21.00%	15.00%
tier 1 ratio	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Crédit Agricole
2014	11.92%	12.11%	9.09%	10.61%	16.10%	11.50%	10.90%	12.74%
2015	12.87%	13.13%	10.24%	11.10%	14.70%	10.90%	11.90%	11.43%
2016	12.87%	12.98%	10.38%	11.37%	15.60%	12.90%	13.60%	11.41%
2017	12.77%	13.09%	10.63%	11.15%	16.80%	13.20%	14.50%	13.00%
2018	12.98%	13.83%	11.55%	11.41%	14.90%	13.10%	14.00%	11.47%
2019	13.20%	13.88%	11.24%	11.30%	15.30%	13.00%	14.70%	12.00%
NPL ratio	ICBC	CCB	ABC	PBOC	Deutsch bank	BNP Paribas	HSBC	Crédit Agricole
2014	1.13%	1.19%	1.54%	1.18%	2.60%	4.56%	2.10%	3.40%
2015	1.50%	1.58%	2.39%	1.43%	2.45%	5.23%	1.98%	3.12%
2016	1.62%	1.52%	2.37%	1.46%	1.92%	5.47%	1.74%	3.01%
2017	1.55%	1.49%	1.81%	1.45%	0.65%	5.32%	1.65%	0.56%
2018	1.52%	1.46%	1.59%	1.42%	1.34%	5.71%	1.40%	2.40%
2019	1.43%	1.42%	1.40%	1.37%	1.45%	6.12%	1.27%	3.20%
Allowance to total loans ratio	ICBC	CCB	ABC	PBOC	Deutsche Bank	BNP Paribas	HSBC	Credit Agricole
2014	2.34%	2.66%	4.42%	2.68%	1.39%	3.52%	1.54%	1.64%
2015	2.35%	2.39%	4.53%	2.62%	1.16%	3.61%	1.49%	1.58%
2016	2.22%	2.29%	4.12%	2.87%	1.10%	3.55%	1.62%	1.52%
2017	2.39%	2.55%	3.77%	2.77%	0.93%	3.62%	1.76%	1.33%
2018	2.68%	3.04%	4.02%	3.07%	1.03%	3.04%	1.75%	1.23%
2019	2.86%	3.23%	4.06%	2.97%	0.91%	2.54%	1.80%	1.11%